



Comune di  
Missaglia

Procedura ristretta ai sensi dell'art. 61 del d.lgs. n. 50/2016 per la selezione di una energy service company (esco) ai fini dell'affidamento della concessione mista di beni e servizi per la riqualificazione energetica e la gestione degli impianti di pubblica illuminazione di proprietà del Comune di Missaglia da realizzarsi con finanziamento tramite terzi (ftt), ai sensi degli artt. 2, comma 1, lett. m) e 15 del d.lgs. n. 115/2008.



## Comune di Missaglia

### PROGETTO DEFINITIVO-ESECUTIVO

#### 1.RG-3-All.2- Allegato 2-Accensione/spegnimento impianti d'illuminazione e cicli di regolazione del flusso luminoso



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## 1 ACCENSIONE/SPEGNIMENTO IMPIANTI D'ILLUMINAZIONE E CICLI DI REGOLAZIONE DEL FLUSSO LUMINOSO

### 1.1 Introduzione

Il piano orario proposto è coerente con i principi di regolazione del progetto definitivo.

Lo stesso, per maggiore precisione e qualità del risultato proposto, è stato calcolato per anno solare in funzione:

- di longitudine e latitudine de luogo
- delle effemeridi astronomiche di alba e tramonto del sole
- dell'effetto correttivo di rifrazione dell'atmosfera terrestre

### 1.2 Fasce orarie di intervento e profili di regolazione

#### 1.2.1 Profili di regolazione consentiti dal progetto

La regolazione massima consentita è fortemente vincolata alle classificazioni del territorio e a come le stesse interagiscono fra loro. Sebbene si possano definire profili diversi di regolazione massima questi sono fortemente vincolanti in una regolazione STATICA al variare della categoria illuminotecnica di progetto.

Il problema è sostanzialmente di natura pratico negli anni risulterà difficile la gestione, con possibili numerosi disservizi e rischio di mantenere i corretti parametri illuminotecnici nel tempo, del parco lampade se non si adotta una soluzione unitaria nelle regolazioni ove gli apparecchi non saranno dotati di sistema di telecontrollo.

La norma UNI11248 consente una regolazione sulla categoria illuminotecnica di 1 o 2 step in funzione dell'analisi dei rischi e della classificazione illuminotecnica di esercizio.

Dovendo adottare un' unica regolazione anche per uniformità e sicurezza sul territorio si evincono le seguenti situazioni:

REGOLAZIONE A STEP secondo UNI 11248							
da	cd/m2	a	cd/m2	Rid. %	a	cd/m2	Rid. %
M3	1	M4	0,75	25,0	M5	0,5	50,0
M4	0,75	M5	0,5	33,3			
M5	0,5	M6	0,3	40,0			
C2	20	C3	15	25,0			
C3	15	C4	10	33,3			
C4	10	C5	7,5	25,0			
P2	10	P3	7,5	25,0			
P3	7,5	P4	5	33,3			
P4	5	P5	3	40,0			

Dove per l'analisi dei rischi essendo stata adottato un declassamento di solo una classe per le M3 è possibile fare anche due step di riduzione successivi in funzione del raggiungimento del 25% del traffico massimo per



corsia consentito per quella tipologia di strada.

Da questa categoria evidenziando che esiste una relazione diretta fra le classi M, C e P che di seguito evidenziamo:

CORRELAZIONI CLASSI M, C, P		
Classe M	Classe C*	Classe P
M3	C2	P2
M4	C3	P3
M5	C4	P4

\* La categoria C è di un livello superiore in quanto impiegata delle zone di interferenza (piazze, incroci, rotonde, etc..) e maggiore rischio e come prescrive la norma deve di un livello superiore alla strada su insiste

Andando a verificare la percentuale di riduzione massima del raggruppamento questa non può essere superiore a quella della categoria con una riduzione massima inferiore fra le 3 (M, C, P) ne conseguono due scenari operativi:

**REGOLAZIONE TIPO 1 – FUNZIONE DELLA PERCENTUALE DI RIDUZIONE MASSIMA**

Classe M	Classe C	Classe P	Rid. %
M3->M4	C2->C3	P2->P3	25,0
M4->M5	C3->C4	P3->P4	33,3
M5->M6	C4->C5	P4.>P5	40,0

**REGOLAZIONE TIPO 2 – FUNZIONE DELLA PERCENTUALE DI RIDUZIONE MASSIMA**

Classe M	Classe C	Classe P	Rid. %
M3->M4	C2->C4	P2->P4	50,0
M4->M5	C3->C4	P3->P4	33,3
M5->M6	C4->C5	P4.>P5	40,0*

Per la categoria illuminotecnica M6 non essendoci altri elementi di declassamento all'interno della classe M si può scendere alla classe P e quindi nello specifico alla P5.

## 1.2.2 Soluzione dei profili di regolazione adottati

La tecnologia LED permette una facile ed affidabile regolazione del flusso luminoso. Gli apparecchi sono equipaggiati con un alimentatore elettronico in grado di regolare l'emissione luminosa agendo direttamente sulla corrente che alimenta i LED del gruppo ottico e configurato con un profilo di dimmerazione che permette di sfruttare la massima intensità luminosa nelle prime e nelle ultime ore di accensione dell'impianto, riducendo i consumi energetici nelle ore centrali della notte, quando frequentemente è sufficiente un livello di illuminazione inferiore. Il profilo di riduzione si adatta automaticamente alla durata del periodo notturno durante l'anno.

Sarà possibile raggiungere la percentuale di risparmio energetico richiesta anche tramite l'ottimizzazione degli orari di accensione, ovvero introducendo una dimmerazione ad hoc una dei corpi illuminanti grazie al sistema di telecontrollo punto-punto. Quest'ultimi funzioneranno con potenza ridotta nelle fasce orarie di diminuzione dei flussi di traffico. La tabella di seguito riportata riporta il dettaglio delle ore di riduzione:



### Dettaglio degli orari di dimmerazione

Ora di inizio riduzione flusso al 70% (per tutti gli ambiti)	22:00
Ora di inizio riduzione flusso al 50% (per gli ambiti M3 e M4, P e C)	00:00
Ora di fine riduzione flusso	06:00

La tabella riportata è leggermente diversa da quella del progetto di fattibilità perché deve tener conto dell'impossibilità di ridurre di due categorie illuminotecniche le strade di classe M5 il risultato complessivo è del tutto indifferente ai fini della riduzione / incremento dei consumi.

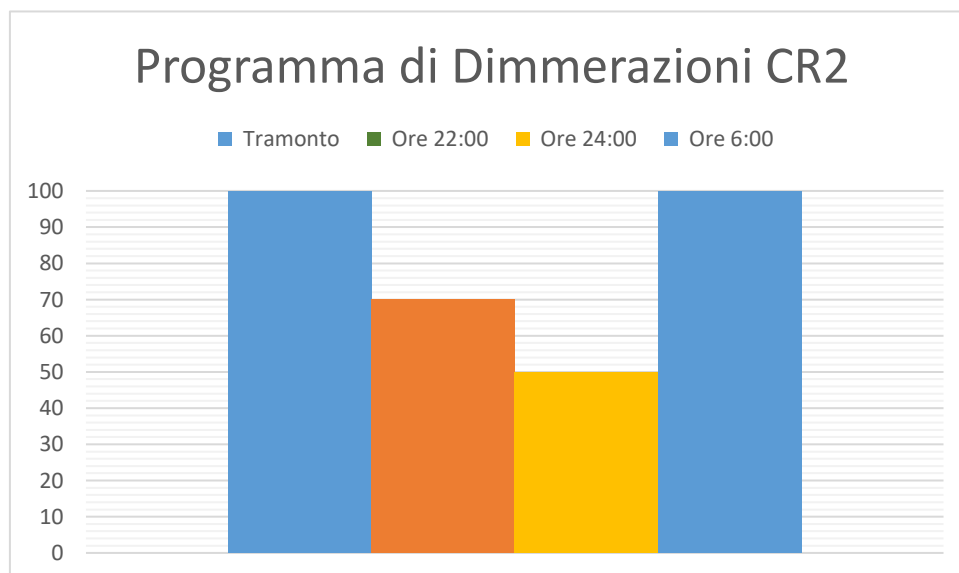
La strategia adottata è quella di seguito rappresentata.

**La regolazione avviene in 2 step di riduzione.**

Le fasce orarie di intervento di ciascun profilo di regolazione sono le seguenti:

#### Profilo di Regolazione CR2

Ora	Reg. %
Tramonto	100
Inizio Ore 22:00	75
Inizio Ore 24:00	50
Ore 6:00	100
Alba	100





## 1.3 Ritardi/Anticipi di spegnimento/accensione

### 1.3.1 Analisi preliminare delle criticità

Il sistema è stato predisposto mediante l'intervento del sistema di accensione con ritardi ed anticipi preconfigurati. La soluzione adottata deve assolvere a due criticità fondamentali oggi presenti sul territorio:

- Accensione/spegnimento contemporaneo per tutto il territorio e per evitare problemi di sicurezza
- Scelta di accensione/spegnimenti adeguati alla conformità del territorio anche da un punto di vista morfologico evitando di anticipare troppo lo spegnimento o di ritardare troppo l'accensione.

L'adozione di un sistema di telecontrollo da quadro e dei relativi orologi astronomici permette di risolvere entrambe le criticità ed in particolare la scelta dei ritardi di accensione e anticipi di spegnimento sono state ponderate in funzione dei range massimi in cui ci si vuole muovere. Nello specifico:

- Limite superiore: 4200 ore di accensione annue conseguibili come oggi con fotocellula o con orologio astronomico con ritardo / anticipo di accensione/spegnimento sul crepuscolo civile di +/-8 minuti
- Limite inferiore: 4000 ore di accensione annue consigliato come obiettivo nelle linee guida ENEA ma che implicano un settaggio degli orologi astronomici con ritardo / anticipo di accensione/spegnimento sul crepuscolo civile di +/-24 minuti

Per fare una scelta ponderata è necessario conoscere durata e caratteristiche di alba e tramonto come di seguito descritto.

Gli orari di durata delle accensioni verranno realizzate in coerenza con le indicazioni del progetto di gara e di ENEA.

## 1.4 Configurazione finale del sistema di regolazione

La scelta dei sistemi di regolazione di orari di accensione e spegnimento e delle curve di regolazione deve essere coerente con le effettive esigenze.

### Accensioni e spegnimenti

Il seguente progetto è stato realizzato considerando l'installazione di orologi astronomici su tutti i quadri elettrici comunali con una regolazione in termini di accensione con un ritardo di 15 minuti rispetto al tramonto e con un anticipo di 15 minuti prima dell'alba.

### Regolazione del flusso luminoso

Per quanto riguarda la regolazione del flusso luminoso verranno impiegati apparecchi con sistema di regolazione integrato stand-alone in grado di calcolarsi la mezzanotte virtuale con settaggio di fabbrica:

- Inizio regolazione minima del 30% entro le ore 22:00
- Fine della regolazione alle 6 del mattino.





1.5 Tabella degli orari di accensione e spegnimento e calcolo delle ore di accensione annua

Ciclo di regolazione CR1

Mese	Giorno	Tramonto Corretto* (ritardo dell'OA)	Alba Corretta* (anticipo dell'OA)	Ore/day di luce artificiale	INIZIO Riduzione Fase 1	Durata fase non Regolata	INIZIO Riduzione Fase 2	ORE fra Riduzione 1-2	ORE Riduzione sino 24	FINE Riduzione	ORE fra ore 24 e fine Riduz.	ORE fra Fine Riduz. e Alba
Gen	1	17:05:18	07:48:14	14:42:56	22:00:00	04:54:42	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:23
Gen	2	17:06:13	07:48:16	14:42:03	22:00:00	04:53:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:25
Gen	3	17:07:11	07:48:15	14:41:04	22:00:00	04:52:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:24
Gen	4	17:08:10	07:48:11	14:40:01	22:00:00	04:51:50	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:20
Gen	5	17:09:11	07:48:05	14:38:54	22:00:00	04:50:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:14
Gen	6	17:10:14	07:47:57	14:37:43	22:00:00	04:49:46	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:06
Gen	7	17:11:19	07:47:45	14:36:26	22:00:00	04:48:41	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:54
Gen	8	17:12:25	07:47:31	14:35:06	22:00:00	04:47:35	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:40
Gen	9	17:13:33	07:47:14	14:33:41	22:00:00	04:46:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:23
Gen	10	17:14:42	07:46:55	14:32:13	22:00:00	04:45:18	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:04
Gen	11	17:15:53	07:46:33	14:30:40	22:00:00	04:44:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:53:42
Gen	12	17:17:05	07:46:09	14:29:04	22:00:00	04:42:55	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:53:18
Gen	13	17:18:18	07:45:42	14:27:24	22:00:00	04:41:42	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:52:51
Gen	14	17:19:33	07:45:12	14:25:39	22:00:00	04:40:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:52:21
Gen	15	17:20:49	07:44:40	14:23:51	22:00:00	04:39:11	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:51:49
Gen	16	17:22:06	07:44:06	14:22:00	22:00:00	04:37:54	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:51:15
Gen	17	17:23:24	07:43:29	14:20:05	22:00:00	04:36:36	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:50:38
Gen	18	17:24:43	07:42:49	14:18:06	22:00:00	04:35:17	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:49:58
Gen	19	17:26:03	07:42:08	14:16:05	22:00:00	04:33:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:49:17
Gen	20	17:27:24	07:41:23	14:13:59	22:00:00	04:32:36	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:48:32
Gen	21	17:28:46	07:40:37	14:11:51	22:00:00	04:31:14	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:47:46
Gen	22	17:30:08	07:39:48	14:09:40	22:00:00	04:29:52	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:46:57
Gen	23	17:31:32	07:38:57	14:07:25	22:00:00	04:28:28	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:46:06
Gen	24	17:32:55	07:38:04	14:05:09	22:00:00	04:27:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:45:13
Gen	25	17:34:20	07:37:09	14:02:49	22:00:00	04:25:40	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:44:18
Gen	26	17:35:45	07:36:12	14:00:27	22:00:00	04:24:15	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:43:21
Gen	27	17:37:10	07:35:12	13:58:02	22:00:00	04:22:50	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:42:21
Gen	28	17:38:36	07:34:10	13:55:34	22:00:00	04:21:24	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:41:19
Gen	29	17:40:02	07:33:07	13:53:05	22:00:00	04:19:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:40:16
Gen	30	17:41:29	07:32:01	13:50:32	22:00:00	04:18:31	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:39:10
Gen	31	17:42:55	07:30:54	13:47:59	22:00:00	04:17:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:38:03
Feb	1	17:44:22	07:29:44	13:45:22	22:00:00	04:15:38	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:36:53
Feb	2	17:45:50	07:28:33	13:42:43	22:00:00	04:14:10	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:35:42
Feb	3	17:47:17	07:27:20	13:40:03	22:00:00	04:12:43	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:34:29
Feb	4	17:48:45	07:26:05	13:37:20	22:00:00	04:11:15	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:33:14





Feb	5	17:50:12	07:24:49	13:34:37	22:00:00	04:09:48	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:31:58
Feb	6	17:51:40	07:23:31	13:31:51	22:00:00	04:08:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:30:40
Feb	7	17:53:07	07:22:11	13:29:04	22:00:00	04:06:53	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:29:20
Feb	8	17:54:35	07:20:50	13:26:15	22:00:00	04:05:25	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:27:59
Feb	9	17:56:03	07:19:27	13:23:24	22:00:00	04:03:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:26:36
Feb	10	17:57:30	07:18:02	13:20:32	22:00:00	04:02:30	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:25:11
Feb	11	17:58:58	07:16:36	13:17:38	22:00:00	04:01:02	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:23:45
Feb	12	18:00:25	07:15:09	13:14:44	22:00:00	03:59:35	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:22:18
Feb	13	18:01:52	07:13:40	13:11:48	22:00:00	03:58:08	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:20:49
Feb	14	18:03:19	07:12:10	13:08:51	22:00:00	03:56:41	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:19:19
Feb	15	18:04:46	07:10:39	13:05:53	22:00:00	03:55:14	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:17:48
Feb	16	18:06:13	07:09:06	13:02:53	22:00:00	03:53:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:16:15
Feb	17	18:07:39	07:07:32	12:59:53	22:00:00	03:52:21	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:14:41
Feb	18	18:09:05	07:05:57	12:56:52	22:00:00	03:50:55	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:13:06
Feb	19	18:10:31	07:04:21	12:53:50	22:00:00	03:49:29	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:11:30
Feb	20	18:11:57	07:02:44	12:50:47	22:00:00	03:48:03	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:09:53
Feb	21	18:13:23	07:01:06	12:47:43	22:00:00	03:46:37	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:08:15
Feb	22	18:14:48	06:59:26	12:44:38	22:00:00	03:45:12	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:06:35
Feb	23	18:16:13	06:57:46	12:41:33	22:00:00	03:43:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:04:55
Feb	24	18:17:38	06:56:04	12:38:26	22:00:00	03:42:22	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:03:13
Feb	25	18:19:02	06:54:22	12:35:20	22:00:00	03:40:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:01:31
Feb	26	18:20:26	06:52:39	12:32:13	22:00:00	03:39:34	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:59:48
Feb	27	18:21:50	06:50:55	12:29:05	22:00:00	03:38:10	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:58:04
Feb	28	18:23:14	06:49:10	12:25:56	22:00:00	03:36:46	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:56:19
Mar	1	18:24:37	06:47:25	12:22:48	22:00:00	03:35:23	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:54:34
Mar	2	18:26:00	06:45:38	12:19:38	22:00:00	03:34:00	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:52:47
Mar	3	18:27:23	06:43:51	12:16:28	22:00:00	03:32:37	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:51:00
Mar	4	18:28:45	06:42:04	12:13:19	22:00:00	03:31:15	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:49:13
Mar	5	18:30:07	06:40:15	12:10:08	22:00:00	03:29:53	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:47:24
Mar	6	18:31:29	06:38:26	12:06:57	22:00:00	03:28:31	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:45:35
Mar	7	18:32:51	06:36:37	12:03:46	22:00:00	03:27:09	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:43:46
Mar	8	18:34:12	06:34:47	12:00:35	22:00:00	03:25:48	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:41:56
Mar	9	18:35:33	06:32:56	11:57:23	22:00:00	03:24:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:40:05
Mar	10	18:36:54	06:31:05	11:54:11	22:00:00	03:23:06	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:38:14
Mar	11	18:38:15	06:29:14	11:50:59	22:00:00	03:21:45	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:36:23
Mar	12	18:39:35	06:27:22	11:47:47	22:00:00	03:20:25	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:34:31
Mar	13	18:40:55	06:25:30	11:44:35	22:00:00	03:19:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:32:39
Mar	14	18:42:15	06:23:37	11:41:22	22:00:00	03:17:45	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:30:46
Mar	15	18:43:35	06:21:45	11:38:10	22:00:00	03:16:25	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:28:54
Mar	16	18:44:55	06:19:51	11:34:56	22:00:00	03:15:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:27:00
Mar	17	18:46:14	06:17:58	11:31:44	22:00:00	03:13:46	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:25:07
Mar	18	18:47:33	06:16:05	11:28:32	22:00:00	03:12:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:23:14
Mar	19	18:48:52	06:14:11	11:25:19	22:00:00	03:11:08	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:21:20



Mar	20	18:50:11	06:12:17	11:22:06	22:00:00	03:09:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:19:26
Mar	21	18:51:30	06:10:23	11:18:53	22:00:00	03:08:30	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:17:32
Mar	22	18:52:48	06:08:29	11:15:41	22:00:00	03:07:12	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:15:38
Mar	23	18:54:06	06:06:35	11:12:29	22:00:00	03:05:54	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:13:44
Mar	24	18:55:25	06:04:40	11:09:15	22:00:00	03:04:35	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:11:49
Mar	25	18:56:43	06:02:46	11:06:03	22:00:00	03:03:17	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:09:55
Mar	26	18:58:01	06:00:52	11:02:51	22:00:00	03:01:59	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:08:01
Mar	27	18:59:19	05:58:58	10:59:39	22:00:00	03:00:41	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:06:07
Mar	28	19:00:37	05:57:04	10:56:27	22:00:00	02:59:23	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:04:13
Mar	29	19:01:55	05:55:10	10:53:15	22:00:00	02:58:05	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:02:19
Mar	30	19:03:12	05:53:17	10:50:05	22:00:00	02:56:48	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:00:26
Mar	31	19:04:30	05:51:23	10:46:53	22:00:00	02:55:30	00:00:00	01:30:00	00:30:00	06:00:00	05:58:32	00:00:00
Apr	1	19:05:48	05:49:30	10:43:42	22:00:00	02:54:12	00:00:00	01:30:00	00:30:00	06:00:00	05:56:39	00:00:00
Apr	2	19:07:05	05:47:37	10:40:32	22:00:00	02:52:55	00:00:00	01:30:00	00:30:00	06:00:00	05:54:46	00:00:00
Apr	3	19:08:23	05:45:44	10:37:21	22:00:00	02:51:37	00:00:00	01:30:00	00:30:00	06:00:00	05:52:53	00:00:00
Apr	4	19:09:40	05:43:52	10:34:12	22:00:00	02:50:20	00:00:00	01:30:00	00:30:00	06:00:00	05:51:01	00:00:00
Apr	5	19:10:58	05:42:00	10:31:02	22:00:00	02:49:02	00:00:00	01:30:00	00:30:00	06:00:00	05:49:09	00:00:00
Apr	6	19:12:15	05:40:08	10:27:53	22:00:00	02:47:45	00:00:00	01:30:00	00:30:00	06:00:00	05:47:17	00:00:00
Apr	7	19:13:33	05:38:16	10:24:43	22:00:00	02:46:27	00:00:00	01:30:00	00:30:00	06:00:00	05:45:25	00:00:00
Apr	8	19:14:50	05:36:26	10:21:36	22:00:00	02:45:10	00:00:00	01:30:00	00:30:00	06:00:00	05:43:35	00:00:00
Apr	9	19:16:08	05:34:35	10:18:27	22:00:00	02:43:52	00:00:00	01:30:00	00:30:00	06:00:00	05:41:44	00:00:00
Apr	10	19:17:25	05:32:45	10:15:20	22:00:00	02:42:35	00:00:00	01:30:00	00:30:00	06:00:00	05:39:54	00:00:00
Apr	11	19:18:42	05:30:56	10:12:14	22:00:00	02:41:18	00:00:00	01:30:00	00:30:00	06:00:00	05:38:05	00:00:00
Apr	12	19:20:00	05:29:07	10:09:07	22:00:00	02:40:00	00:00:00	01:30:00	00:30:00	06:00:00	05:36:16	00:00:00
Apr	13	19:21:17	05:27:19	10:06:02	22:00:00	02:38:43	00:00:00	01:30:00	00:30:00	06:00:00	05:34:28	00:00:00
Apr	14	19:22:35	05:25:32	10:02:57	22:00:00	02:37:25	00:00:00	01:30:00	00:30:00	06:00:00	05:32:41	00:00:00
Apr	15	19:23:52	05:23:45	09:59:53	22:00:00	02:36:08	00:00:00	01:30:00	00:30:00	06:00:00	05:30:54	00:00:00
Apr	16	19:25:09	05:21:58	09:56:49	22:00:00	02:34:51	00:00:00	01:30:00	00:30:00	06:00:00	05:29:07	00:00:00
Apr	17	19:26:27	05:20:13	09:53:46	22:00:00	02:33:33	00:00:00	01:30:00	00:30:00	06:00:00	05:27:22	00:00:00
Apr	18	19:27:44	05:18:28	09:50:44	22:00:00	02:32:16	00:00:00	01:30:00	00:30:00	06:00:00	05:25:37	00:00:00
Apr	19	19:29:02	05:16:45	09:47:43	22:00:00	02:30:58	00:00:00	01:30:00	00:30:00	06:00:00	05:23:54	00:00:00
Apr	20	19:30:19	05:15:01	09:44:42	22:00:00	02:29:41	00:00:00	01:30:00	00:30:00	06:00:00	05:22:10	00:00:00
Apr	21	19:31:36	05:13:19	09:41:43	22:00:00	02:28:24	00:00:00	01:30:00	00:30:00	06:00:00	05:20:28	00:00:00
Apr	22	19:32:53	05:11:38	09:38:45	22:00:00	02:27:07	00:00:00	01:30:00	00:30:00	06:00:00	05:18:47	00:00:00
Apr	23	19:34:10	05:09:58	09:35:48	22:00:00	02:25:50	00:00:00	01:30:00	00:30:00	06:00:00	05:17:07	00:00:00
Apr	24	19:35:27	05:08:18	09:32:51	22:00:00	02:24:33	00:00:00	01:30:00	00:30:00	06:00:00	05:15:27	00:00:00
Apr	25	19:36:44	05:06:40	09:29:56	22:00:00	02:23:16	00:00:00	01:30:00	00:30:00	06:00:00	05:13:49	00:00:00
Apr	26	19:38:01	05:05:03	09:27:02	22:00:00	02:21:59	00:00:00	01:30:00	00:30:00	06:00:00	05:12:12	00:00:00
Apr	27	19:39:18	05:03:27	09:24:09	22:00:00	02:20:42	00:00:00	01:30:00	00:30:00	06:00:00	05:10:36	00:00:00
Apr	28	19:40:35	05:01:51	09:21:16	22:00:00	02:19:25	00:00:00	01:30:00	00:30:00	06:00:00	05:09:00	00:00:00
Apr	29	19:41:51	05:00:17	09:18:26	22:00:00	02:18:09	00:00:00	01:30:00	00:30:00	06:00:00	05:07:26	00:00:00
Apr	30	19:43:08	04:58:45	09:15:37	22:00:00	02:16:52	00:00:00	01:30:00	00:30:00	06:00:00	05:05:54	00:00:00
Mag	1	19:44:24	04:57:13	09:12:49	22:00:00	02:15:36	00:00:00	01:30:00	00:30:00	06:00:00	05:04:22	00:00:00



Mag	2	19:45:40	04:55:43	09:10:03	22:00:00	02:14:20	00:00:00	01:30:00	00:30:00	06:00:00	05:02:52	00:00:00
Mag	3	19:46:55	04:54:14	09:07:19	22:00:00	02:13:05	00:00:00	01:30:00	00:30:00	06:00:00	05:01:23	00:00:00
Mag	4	19:48:11	04:52:46	09:04:35	22:00:00	02:11:49	00:00:00	01:30:00	00:30:00	06:00:00	04:59:55	00:00:00
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Mag	6	19:50:41	04:49:55	08:59:14	22:00:00	02:09:19	00:00:00	01:30:00	00:30:00	06:00:00	04:57:04	00:00:00
Mag	7	19:51:55	04:48:32	08:56:37	22:00:00	02:08:05	00:00:00	01:30:00	00:30:00	06:00:00	04:55:41	00:00:00
Mag	8	19:53:09	04:47:10	08:54:01	22:00:00	02:06:51	00:00:00	01:30:00	00:30:00	06:00:00	04:54:19	00:00:00
Mag	9	19:54:23	04:45:49	08:51:26	22:00:00	02:05:37	00:00:00	01:30:00	00:30:00	06:00:00	04:52:58	00:00:00
Mag	10	19:55:36	04:44:31	08:48:55	22:00:00	02:04:24	00:00:00	01:30:00	00:30:00	06:00:00	04:51:40	00:00:00
Mag	11	19:56:49	04:43:13	08:46:24	22:00:00	02:03:11	00:00:00	01:30:00	00:30:00	06:00:00	04:50:22	00:00:00
Mag	12	19:58:01	04:41:58	08:43:57	22:00:00	02:01:59	00:00:00	01:30:00	00:30:00	06:00:00	04:49:07	00:00:00
Mag	13	19:59:13	04:40:44	08:41:31	22:00:00	02:00:47	00:00:00	01:30:00	00:30:00	06:00:00	04:47:53	00:00:00
Mag	14	20:00:24	04:39:31	08:39:07	22:00:00	01:59:36	00:00:00	01:30:00	00:30:00	06:00:00	04:46:40	00:00:00
Mag	15	20:01:35	04:38:21	08:36:46	22:00:00	01:58:25	00:00:00	01:30:00	00:30:00	06:00:00	04:45:30	00:00:00
Mag	16	20:02:45	04:37:12	08:34:27	22:00:00	01:57:15	00:00:00	01:30:00	00:30:00	06:00:00	04:44:21	00:00:00
Mag	17	20:03:54	04:36:05	08:32:11	22:00:00	01:56:06	00:00:00	01:30:00	00:30:00	06:00:00	04:43:14	00:00:00
Mag	18	20:05:02	04:35:00	08:29:58	22:00:00	01:54:58	00:00:00	01:30:00	00:30:00	06:00:00	04:42:09	00:00:00
Mag	19	20:06:10	04:33:57	08:27:47	22:00:00	01:53:50	00:00:00	01:30:00	00:30:00	06:00:00	04:41:06	00:00:00
Mag	20	20:07:16	04:32:56	08:25:40	22:00:00	01:52:44	00:00:00	01:30:00	00:30:00	06:00:00	04:40:05	00:00:00
Mag	21	20:08:22	04:31:56	08:23:34	22:00:00	01:51:38	00:00:00	01:30:00	00:30:00	06:00:00	04:39:05	00:00:00
Mag	22	20:09:27	04:30:59	08:21:32	22:00:00	01:50:33	00:00:00	01:30:00	00:30:00	06:00:00	04:38:08	00:00:00
Mag	23	20:10:31	04:30:04	08:19:33	22:00:00	01:49:29	00:00:00	01:30:00	00:30:00	06:00:00	04:37:13	00:00:00
Mag	24	20:11:34	04:29:10	08:17:36	22:00:00	01:48:26	00:00:00	01:30:00	00:30:00	06:00:00	04:36:19	00:00:00
Mag	25	20:12:35	04:28:19	08:15:44	22:00:00	01:47:25	00:00:00	01:30:00	00:30:00	06:00:00	04:35:28	00:00:00
Mag	26	20:13:36	04:27:30	08:13:54	22:00:00	01:46:24	00:00:00	01:30:00	00:30:00	06:00:00	04:34:39	00:00:00
Mag	27	20:14:35	04:26:43	08:12:08	22:00:00	01:45:25	00:00:00	01:30:00	00:30:00	06:00:00	04:33:52	00:00:00
Mag	28	20:15:33	04:25:58	08:10:25	22:00:00	01:44:27	00:00:00	01:30:00	00:30:00	06:00:00	04:33:07	00:00:00
Mag	29	20:16:30	04:25:16	08:08:46	22:00:00	01:43:30	00:00:00	01:30:00	00:30:00	06:00:00	04:32:25	00:00:00
Mag	30	20:17:26	04:24:35	08:07:09	22:00:00	01:42:34	00:00:00	01:30:00	00:30:00	06:00:00	04:31:44	00:00:00
Mag	31	20:18:20	04:23:57	08:05:37	22:00:00	01:41:40	00:00:00	01:30:00	00:30:00	06:00:00	04:31:06	00:00:00
Giu	1	20:19:12	04:23:21	08:04:09	22:00:00	01:40:48	00:00:00	01:30:00	00:30:00	06:00:00	04:30:30	00:00:00
Giu	2	20:20:04	04:22:47	08:02:43	22:00:00	01:39:56	00:00:00	01:30:00	00:30:00	06:00:00	04:29:56	00:00:00
Giu	3	20:20:53	04:22:16	08:01:23	22:00:00	01:39:07	00:00:00	01:30:00	00:30:00	06:00:00	04:29:25	00:00:00
Giu	4	20:21:41	04:21:47	08:00:06	22:00:00	01:38:19	00:00:00	01:30:00	00:30:00	06:00:00	04:28:56	00:00:00
Giu	5	20:22:27	04:21:20	07:58:53	22:00:00	01:37:33	00:00:00	01:30:00	00:30:00	06:00:00	04:28:29	00:00:00
Giu	6	20:23:12	04:20:55	07:57:43	22:00:00	01:36:48	00:00:00	01:30:00	00:30:00	06:00:00	04:28:04	00:00:00
Giu	7	20:23:55	04:20:33	07:56:38	22:00:00	01:36:05	00:00:00	01:30:00	00:30:00	06:00:00	04:27:42	00:00:00
Giu	8	20:24:36	04:20:14	07:55:38	22:00:00	01:35:24	00:00:00	01:30:00	00:30:00	06:00:00	04:27:23	00:00:00
Giu	9	20:25:15	04:19:56	07:54:41	22:00:00	01:34:45	00:00:00	01:30:00	00:30:00	06:00:00	04:27:05	00:00:00
Giu	10	20:25:52	04:19:41	07:53:49	22:00:00	01:34:08	00:00:00	01:30:00	00:30:00	06:00:00	04:26:50	00:00:00
Giu	11	20:26:28	04:19:29	07:53:01	22:00:00	01:33:32	00:00:00	01:30:00	00:30:00	06:00:00	04:26:38	00:00:00
Giu	12	20:27:01	04:19:18	07:52:17	22:00:00	01:32:59	00:00:00	01:30:00	00:30:00	06:00:00	04:26:27	00:00:00
Giu	13	20:27:33	04:19:10	07:51:37	22:00:00	01:32:27	00:00:00	01:30:00	00:30:00	06:00:00	04:26:19	00:00:00



Giu	14	20:28:02	04:19:05	07:51:03	22:00:00	01:31:58	00:00:00	01:30:00	00:30:00	06:00:00	04:26:14	00:00:00
Giu	15	20:28:29	04:19:02	07:50:33	22:00:00	01:31:31	00:00:00	01:30:00	00:30:00	06:00:00	04:26:11	00:00:00
Giu	16	20:28:54	04:19:01	07:50:07	22:00:00	01:31:06	00:00:00	01:30:00	00:30:00	06:00:00	04:26:10	00:00:00
Giu	17	20:29:17	04:19:02	07:49:45	22:00:00	01:30:43	00:00:00	01:30:00	00:30:00	06:00:00	04:26:11	00:00:00
Giu	18	20:29:38	04:19:06	07:49:28	22:00:00	01:30:22	00:00:00	01:30:00	00:30:00	06:00:00	04:26:15	00:00:00
Giu	19	20:29:56	04:19:12	07:49:16	22:00:00	01:30:04	00:00:00	01:30:00	00:30:00	06:00:00	04:26:21	00:00:00
Giu	20	20:30:13	04:19:21	07:49:08	22:00:00	01:29:47	00:00:00	01:30:00	00:30:00	06:00:00	04:26:30	00:00:00
Giu	21	20:30:27	04:19:32	07:49:05	22:00:00	01:29:33	00:00:00	01:30:00	00:30:00	06:00:00	04:26:41	00:00:00
Giu	22	20:30:38	04:19:45	07:49:07	22:00:00	01:29:22	00:00:00	01:30:00	00:30:00	06:00:00	04:26:54	00:00:00
Giu	23	20:30:47	04:20:00	07:49:13	22:00:00	01:29:13	00:00:00	01:30:00	00:30:00	06:00:00	04:27:09	00:00:00
Giu	24	20:30:54	04:20:17	07:49:23	22:00:00	01:29:06	00:00:00	01:30:00	00:30:00	06:00:00	04:27:26	00:00:00
Giu	25	20:30:59	04:20:37	07:49:38	22:00:00	01:29:01	00:00:00	01:30:00	00:30:00	06:00:00	04:27:46	00:00:00
Giu	26	20:31:01	04:20:59	07:49:58	22:00:00	01:28:59	00:00:00	01:30:00	00:30:00	06:00:00	04:28:08	00:00:00
Giu	27	20:31:01	04:21:22	07:50:21	22:00:00	01:28:59	00:00:00	01:30:00	00:30:00	06:00:00	04:28:31	00:00:00
Giu	28	20:30:59	04:21:48	07:50:49	22:00:00	01:29:01	00:00:00	01:30:00	00:30:00	06:00:00	04:28:57	00:00:00
Giu	29	20:30:54	04:22:16	07:51:22	22:00:00	01:29:06	00:00:00	01:30:00	00:30:00	06:00:00	04:29:25	00:00:00
Giu	30	20:30:46	04:22:46	07:52:00	22:00:00	01:29:14	00:00:00	01:30:00	00:30:00	06:00:00	04:29:55	00:00:00
Lug	1	20:30:36	04:23:18	07:52:42	22:00:00	01:29:24	00:00:00	01:30:00	00:30:00	06:00:00	04:30:27	00:00:00
Lug	2	20:30:24	04:23:52	07:53:28	22:00:00	01:29:36	00:00:00	01:30:00	00:30:00	06:00:00	04:31:01	00:00:00
Lug	3	20:30:09	04:24:28	07:54:19	22:00:00	01:29:51	00:00:00	01:30:00	00:30:00	06:00:00	04:31:37	00:00:00
Lug	4	20:29:52	04:25:05	07:55:13	22:00:00	01:30:08	00:00:00	01:30:00	00:30:00	06:00:00	04:32:14	00:00:00
Lug	5	20:29:33	04:25:44	07:56:11	22:00:00	01:30:27	00:00:00	01:30:00	00:30:00	06:00:00	04:32:53	00:00:00
Lug	6	20:29:11	04:26:26	07:57:15	22:00:00	01:30:49	00:00:00	01:30:00	00:30:00	06:00:00	04:33:35	00:00:00
Lug	7	20:28:47	04:27:08	07:58:21	22:00:00	01:31:13	00:00:00	01:30:00	00:30:00	06:00:00	04:34:17	00:00:00
Lug	8	20:28:20	04:27:53	07:59:33	22:00:00	01:31:40	00:00:00	01:30:00	00:30:00	06:00:00	04:35:02	00:00:00
Lug	9	20:27:51	04:28:39	08:00:48	22:00:00	01:32:09	00:00:00	01:30:00	00:30:00	06:00:00	04:35:48	00:00:00
Lug	10	20:27:20	04:29:26	08:02:06	22:00:00	01:32:40	00:00:00	01:30:00	00:30:00	06:00:00	04:36:35	00:00:00
Lug	11	20:26:46	04:30:15	08:03:29	22:00:00	01:33:14	00:00:00	01:30:00	00:30:00	06:00:00	04:37:24	00:00:00
Lug	12	20:26:11	04:31:06	08:04:55	22:00:00	01:33:49	00:00:00	01:30:00	00:30:00	06:00:00	04:38:15	00:00:00
Lug	13	20:25:32	04:31:58	08:06:26	22:00:00	01:34:28	00:00:00	01:30:00	00:30:00	06:00:00	04:39:07	00:00:00
Lug	14	20:24:52	04:32:51	08:07:59	22:00:00	01:35:08	00:00:00	01:30:00	00:30:00	06:00:00	04:40:00	00:00:00
Lug	15	20:24:09	04:33:45	08:09:36	22:00:00	01:35:51	00:00:00	01:30:00	00:30:00	06:00:00	04:40:54	00:00:00
Lug	16	20:23:24	04:34:41	08:11:17	22:00:00	01:36:36	00:00:00	01:30:00	00:30:00	06:00:00	04:41:50	00:00:00
Lug	17	20:22:37	04:35:38	08:13:01	22:00:00	01:37:23	00:00:00	01:30:00	00:30:00	06:00:00	04:42:47	00:00:00
Lug	18	20:21:48	04:36:36	08:14:48	22:00:00	01:38:12	00:00:00	01:30:00	00:30:00	06:00:00	04:43:45	00:00:00
Lug	19	20:20:56	04:37:35	08:16:39	22:00:00	01:39:04	00:00:00	01:30:00	00:30:00	06:00:00	04:44:44	00:00:00
Lug	20	20:20:03	04:38:35	08:18:32	22:00:00	01:39:57	00:00:00	01:30:00	00:30:00	06:00:00	04:45:44	00:00:00
Lug	21	20:19:07	04:39:36	08:20:29	22:00:00	01:40:53	00:00:00	01:30:00	00:30:00	06:00:00	04:46:45	00:00:00
Lug	22	20:18:10	04:40:39	08:22:29	22:00:00	01:41:50	00:00:00	01:30:00	00:30:00	06:00:00	04:47:48	00:00:00
Lug	23	20:17:10	04:41:42	08:24:32	22:00:00	01:42:50	00:00:00	01:30:00	00:30:00	06:00:00	04:48:51	00:00:00
Lug	24	20:16:08	04:42:45	08:26:37	22:00:00	01:43:52	00:00:00	01:30:00	00:30:00	06:00:00	04:49:54	00:00:00
Lug	25	20:15:05	04:43:50	08:28:45	22:00:00	01:44:55	00:00:00	01:30:00	00:30:00	06:00:00	04:50:59	00:00:00
Lug	26	20:13:59	04:44:55	08:30:56	22:00:00	01:46:01	00:00:00	01:30:00	00:30:00	06:00:00	04:52:04	00:00:00
Lug	27	20:12:52	04:46:01	08:33:09	22:00:00	01:47:08	00:00:00	01:30:00	00:30:00	06:00:00	04:53:10	00:00:00





Lug	28	20:11:43	04:47:08	08:35:25	22:00:00	01:48:17	00:00:00	01:30:00	00:30:00	06:00:00	04:54:17	00:00:00
Lug	29	20:10:32	04:48:16	08:37:44	22:00:00	01:49:28	00:00:00	01:30:00	00:30:00	06:00:00	04:55:25	00:00:00
Lug	30	20:09:19	04:49:24	08:40:05	22:00:00	01:50:41	00:00:00	01:30:00	00:30:00	06:00:00	04:56:33	00:00:00
Lug	31	20:08:05	04:50:32	08:42:27	22:00:00	01:51:55	00:00:00	01:30:00	00:30:00	06:00:00	04:57:41	00:00:00
Ago	1	20:06:49	04:51:41	08:44:52	22:00:00	01:53:11	00:00:00	01:30:00	00:30:00	06:00:00	04:58:50	00:00:00
Ago	2	20:05:31	04:52:51	08:47:20	22:00:00	01:54:29	00:00:00	01:30:00	00:30:00	06:00:00	05:00:00	00:00:00
Ago	3	20:04:11	04:54:00	08:49:49	22:00:00	01:55:49	00:00:00	01:30:00	00:30:00	06:00:00	05:01:09	00:00:00
Ago	4	20:02:50	04:55:11	08:52:21	22:00:00	01:57:10	00:00:00	01:30:00	00:30:00	06:00:00	05:02:20	00:00:00
Ago	5	20:01:28	04:56:21	08:54:53	22:00:00	01:58:32	00:00:00	01:30:00	00:30:00	06:00:00	05:03:30	00:00:00
Ago	6	20:00:04	04:57:32	08:57:28	22:00:00	01:59:56	00:00:00	01:30:00	00:30:00	06:00:00	05:04:41	00:00:00
Ago	7	19:58:38	04:58:44	09:00:06	22:00:00	02:01:22	00:00:00	01:30:00	00:30:00	06:00:00	05:05:53	00:00:00
Ago	8	19:57:11	04:59:55	09:02:44	22:00:00	02:02:49	00:00:00	01:30:00	00:30:00	06:00:00	05:07:04	00:00:00
Ago	9	19:55:43	05:01:07	09:05:24	22:00:00	02:04:17	00:00:00	01:30:00	00:30:00	06:00:00	05:08:16	00:00:00
Ago	10	19:54:13	05:02:19	09:08:06	22:00:00	02:05:47	00:00:00	01:30:00	00:30:00	06:00:00	05:09:28	00:00:00
Ago	11	19:52:42	05:03:31	09:10:49	22:00:00	02:07:18	00:00:00	01:30:00	00:30:00	06:00:00	05:10:40	00:00:00
Ago	12	19:51:10	05:04:44	09:13:34	22:00:00	02:08:50	00:00:00	01:30:00	00:30:00	06:00:00	05:11:53	00:00:00
Ago	13	19:49:36	05:05:56	09:16:20	22:00:00	02:10:24	00:00:00	01:30:00	00:30:00	06:00:00	05:13:05	00:00:00
Ago	14	19:48:02	05:07:09	09:19:07	22:00:00	02:11:58	00:00:00	01:30:00	00:30:00	06:00:00	05:14:18	00:00:00
Ago	15	19:46:26	05:08:22	09:21:56	22:00:00	02:13:34	00:00:00	01:30:00	00:30:00	06:00:00	05:15:31	00:00:00
Ago	16	19:44:49	05:09:34	09:24:45	22:00:00	02:15:11	00:00:00	01:30:00	00:30:00	06:00:00	05:16:43	00:00:00
Ago	17	19:43:11	05:10:47	09:27:36	22:00:00	02:16:49	00:00:00	01:30:00	00:30:00	06:00:00	05:17:56	00:00:00
Ago	18	19:41:31	05:12:00	09:30:29	22:00:00	02:18:29	00:00:00	01:30:00	00:30:00	06:00:00	05:19:09	00:00:00
Ago	19	19:39:51	05:13:13	09:33:22	22:00:00	02:20:09	00:00:00	01:30:00	00:30:00	06:00:00	05:20:22	00:00:00
Ago	20	19:38:10	05:14:27	09:36:17	22:00:00	02:21:50	00:00:00	01:30:00	00:30:00	06:00:00	05:21:36	00:00:00
Ago	21	19:36:28	05:15:40	09:39:12	22:00:00	02:23:32	00:00:00	01:30:00	00:30:00	06:00:00	05:22:49	00:00:00
Ago	22	19:34:44	05:16:53	09:42:09	22:00:00	02:25:16	00:00:00	01:30:00	00:30:00	06:00:00	05:24:02	00:00:00
Ago	23	19:33:00	05:18:06	09:45:06	22:00:00	02:27:00	00:00:00	01:30:00	00:30:00	06:00:00	05:25:15	00:00:00
Ago	24	19:31:15	05:19:19	09:48:04	22:00:00	02:28:45	00:00:00	01:30:00	00:30:00	06:00:00	05:26:28	00:00:00
Ago	25	19:29:30	05:20:32	09:51:02	22:00:00	02:30:30	00:00:00	01:30:00	00:30:00	06:00:00	05:27:41	00:00:00
Ago	26	19:27:43	05:21:45	09:54:02	22:00:00	02:32:17	00:00:00	01:30:00	00:30:00	06:00:00	05:28:54	00:00:00
Ago	27	19:25:56	05:22:58	09:57:02	22:00:00	02:34:04	00:00:00	01:30:00	00:30:00	06:00:00	05:30:07	00:00:00
Ago	28	19:24:08	05:24:11	10:00:03	22:00:00	02:35:52	00:00:00	01:30:00	00:30:00	06:00:00	05:31:20	00:00:00
Ago	29	19:22:19	05:25:24	10:03:05	22:00:00	02:37:41	00:00:00	01:30:00	00:30:00	06:00:00	05:32:33	00:00:00
Ago	30	19:20:30	05:26:37	10:06:07	22:00:00	02:39:30	00:00:00	01:30:00	00:30:00	06:00:00	05:33:46	00:00:00
Ago	31	19:18:40	05:27:50	10:09:10	22:00:00	02:41:20	00:00:00	01:30:00	00:30:00	06:00:00	05:34:59	00:00:00
Set	1	19:16:49	05:29:03	10:12:14	22:00:00	02:43:11	00:00:00	01:30:00	00:30:00	06:00:00	05:36:12	00:00:00
Set	2	19:14:58	05:30:16	10:15:18	22:00:00	02:45:02	00:00:00	01:30:00	00:30:00	06:00:00	05:37:25	00:00:00
Set	3	19:13:07	05:31:29	10:18:22	22:00:00	02:46:53	00:00:00	01:30:00	00:30:00	06:00:00	05:38:38	00:00:00
Set	4	19:11:14	05:32:42	10:21:28	22:00:00	02:48:46	00:00:00	01:30:00	00:30:00	06:00:00	05:39:51	00:00:00
Set	5	19:09:22	05:33:55	10:24:33	22:00:00	02:50:38	00:00:00	01:30:00	00:30:00	06:00:00	05:41:04	00:00:00
Set	6	19:07:29	05:35:08	10:27:39	22:00:00	02:52:31	00:00:00	01:30:00	00:30:00	06:00:00	05:42:17	00:00:00
Set	7	19:05:35	05:36:21	10:30:46	22:00:00	02:54:25	00:00:00	01:30:00	00:30:00	06:00:00	05:43:30	00:00:00
Set	8	19:03:41	05:37:34	10:33:53	22:00:00	02:56:19	00:00:00	01:30:00	00:30:00	06:00:00	05:44:43	00:00:00



Set	9	19:01:47	05:38:47	10:37:00	22:00:00	02:58:13	00:00:00	01:30:00	00:30:00	06:00:00	05:45:56	00:00:00
Set	10	18:59:52	05:39:59	10:40:07	22:00:00	03:00:08	00:00:00	01:30:00	00:30:00	06:00:00	05:47:08	00:00:00
Set	11	18:57:58	05:41:12	10:43:14	22:00:00	03:02:02	00:00:00	01:30:00	00:30:00	06:00:00	05:48:21	00:00:00
Set	12	18:56:03	05:42:25	10:46:22	22:00:00	03:03:57	00:00:00	01:30:00	00:30:00	06:00:00	05:49:34	00:00:00
Set	13	18:54:07	05:43:38	10:49:31	22:00:00	03:05:53	00:00:00	01:30:00	00:30:00	06:00:00	05:50:47	00:00:00
Set	14	18:52:12	05:44:51	10:52:39	22:00:00	03:07:48	00:00:00	01:30:00	00:30:00	06:00:00	05:52:00	00:00:00
Set	15	18:50:16	05:46:04	10:55:48	22:00:00	03:09:44	00:00:00	01:30:00	00:30:00	06:00:00	05:53:13	00:00:00
Set	16	18:48:20	05:47:17	10:58:57	22:00:00	03:11:40	00:00:00	01:30:00	00:30:00	06:00:00	05:54:26	00:00:00
Set	17	18:46:24	05:48:31	11:02:07	22:00:00	03:13:36	00:00:00	01:30:00	00:30:00	06:00:00	05:55:40	00:00:00
Set	18	18:44:29	05:49:44	11:05:15	22:00:00	03:15:31	00:00:00	01:30:00	00:30:00	06:00:00	05:56:53	00:00:00
Set	19	18:42:32	05:50:57	11:08:25	22:00:00	03:17:28	00:00:00	01:30:00	00:30:00	06:00:00	05:58:06	00:00:00
Set	20	18:40:36	05:52:11	11:11:35	22:00:00	03:19:24	00:00:00	01:30:00	00:30:00	06:00:00	05:59:20	00:00:00
Set	21	18:38:40	05:53:24	11:14:44	22:00:00	03:21:20	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:00:33
Set	22	18:36:44	05:54:38	11:17:54	22:00:00	03:23:16	00:00:00	01:30:00	00:30:00	06:00:00	06:00:00	00:01:47
Set	23	18:34:49	05:55:52	11:21:03	22:00:00	03:25:11	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:03:01
Set	24	18:32:53	05:57:06	11:24:13	22:00:00	03:27:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:04:15
Set	25	18:30:57	05:58:20	11:27:23	22:00:00	03:29:03	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:05:29
Set	26	18:29:02	05:59:34	11:30:32	22:00:00	03:30:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:06:43
Set	27	18:27:06	06:00:49	11:33:43	22:00:00	03:32:54	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:07:58
Set	28	18:25:11	06:02:04	11:36:53	22:00:00	03:34:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:09:13
Set	29	18:23:16	06:03:19	11:40:03	22:00:00	03:36:44	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:10:28
Set	30	18:21:22	06:04:34	11:43:12	22:00:00	03:38:38	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:11:43
Ott	1	18:19:28	06:05:49	11:46:21	22:00:00	03:40:32	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:12:58
Ott	2	18:17:34	06:07:04	11:49:30	22:00:00	03:42:26	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:14:13
Ott	3	18:15:40	06:08:20	11:52:40	22:00:00	03:44:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:15:29
Ott	4	18:13:47	06:09:36	11:55:49	22:00:00	03:46:13	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:16:45
Ott	5	18:11:55	06:10:53	11:58:58	22:00:00	03:48:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:18:02
Ott	6	18:10:03	06:12:09	12:02:06	22:00:00	03:49:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:19:18
Ott	7	18:08:11	06:13:26	12:05:15	22:00:00	03:51:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:20:35
Ott	8	18:06:20	06:14:43	12:08:23	22:00:00	03:53:40	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:21:52
Ott	9	18:04:29	06:16:00	12:11:31	22:00:00	03:55:31	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:23:09
Ott	10	18:02:39	06:17:18	12:14:39	22:00:00	03:57:21	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:24:27
Ott	11	18:00:50	06:18:36	12:17:46	22:00:00	03:59:10	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:25:45
Ott	12	17:59:02	06:19:54	12:20:52	22:00:00	04:00:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:27:03
Ott	13	17:57:14	06:21:13	12:23:59	22:00:00	04:02:46	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:28:22
Ott	14	17:55:27	06:22:32	12:27:05	22:00:00	04:04:33	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:29:41
Ott	15	17:53:40	06:23:51	12:30:11	22:00:00	04:06:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:31:00
Ott	16	17:51:55	06:25:10	12:33:15	22:00:00	04:08:05	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:32:19
Ott	17	17:50:10	06:26:30	12:36:20	22:00:00	04:09:50	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:33:39
Ott	18	17:48:26	06:27:50	12:39:24	22:00:00	04:11:34	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:34:59
Ott	19	17:46:43	06:29:10	12:42:27	22:00:00	04:13:17	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:36:19
Ott	20	17:45:01	06:30:31	12:45:30	22:00:00	04:14:59	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:37:40
Ott	21	17:43:20	06:31:52	12:48:32	22:00:00	04:16:40	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:39:01



Ott	22	17:41:40	06:33:13	12:51:33	22:00:00	04:18:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:40:22
Ott	23	17:40:02	06:34:35	12:54:33	22:00:00	04:19:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:41:44
Ott	24	17:38:24	06:35:57	12:57:33	22:00:00	04:21:36	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:43:06
Ott	25	17:36:47	06:37:19	13:00:32	22:00:00	04:23:13	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:44:28
Ott	26	17:35:12	06:38:41	13:03:29	22:00:00	04:24:48	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:45:50
Ott	27	17:33:38	06:40:04	13:06:26	22:00:00	04:26:22	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:47:13
Ott	28	17:32:05	06:41:27	13:09:22	22:00:00	04:27:55	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:48:36
Ott	29	17:30:33	06:42:50	13:12:17	22:00:00	04:29:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:49:59
Ott	30	17:29:03	06:44:13	13:15:10	22:00:00	04:30:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:51:22
Ott	31	17:27:34	06:45:37	13:18:03	22:00:00	04:32:26	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:52:46
Nov	1	17:26:06	06:47:00	13:20:54	22:00:00	04:33:54	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:54:09
Nov	2	17:24:40	06:48:24	13:23:44	22:00:00	04:35:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:55:33
Nov	3	17:23:16	06:49:48	13:26:32	22:00:00	04:36:44	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:56:57
Nov	4	17:21:53	06:51:12	13:29:19	22:00:00	04:38:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:58:21
Nov	5	17:20:31	06:52:36	13:32:05	22:00:00	04:39:29	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	00:59:45
Nov	6	17:19:12	06:54:00	13:34:48	22:00:00	04:40:48	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:01:09
Nov	7	17:17:53	06:55:24	13:37:31	22:00:00	04:42:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:02:33
Nov	8	17:16:37	06:56:48	13:40:11	22:00:00	04:43:23	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:03:57
Nov	9	17:15:22	06:58:12	13:42:50	22:00:00	04:44:38	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:05:21
Nov	10	17:14:10	06:59:36	13:45:26	22:00:00	04:45:50	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:06:45
Nov	11	17:12:59	07:01:00	13:48:01	22:00:00	04:47:01	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:08:09
Nov	12	17:11:49	07:02:23	13:50:34	22:00:00	04:48:11	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:09:32
Nov	13	17:10:42	07:03:47	13:53:05	22:00:00	04:49:18	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:10:56
Nov	14	17:09:37	07:05:10	13:55:33	22:00:00	04:50:23	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:12:19
Nov	15	17:08:34	07:06:33	13:57:59	22:00:00	04:51:26	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:13:42
Nov	16	17:07:33	07:07:55	14:00:22	22:00:00	04:52:27	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:15:04
Nov	17	17:06:34	07:09:17	14:02:43	22:00:00	04:53:26	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:16:26
Nov	18	17:05:37	07:10:39	14:05:02	22:00:00	04:54:23	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:17:48
Nov	19	17:04:42	07:12:00	14:07:18	22:00:00	04:55:18	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:19:09
Nov	20	17:03:49	07:13:21	14:09:32	22:00:00	04:56:11	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:20:30
Nov	21	17:02:59	07:14:41	14:11:42	22:00:00	04:57:01	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:21:50
Nov	22	17:02:11	07:16:00	14:13:49	22:00:00	04:57:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:23:09
Nov	23	17:01:25	07:17:19	14:15:54	22:00:00	04:58:35	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:24:28
Nov	24	17:00:42	07:18:37	14:17:55	22:00:00	04:59:18	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:25:46
Nov	25	17:00:01	07:19:53	14:19:52	22:00:00	04:59:59	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:27:02
Nov	26	16:59:22	07:21:10	14:21:48	22:00:00	05:00:38	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:28:19
Nov	27	16:58:46	07:22:25	14:23:39	22:00:00	05:01:14	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:29:34
Nov	28	16:58:13	07:23:39	14:25:26	22:00:00	05:01:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:30:48
Nov	29	16:57:42	07:24:52	14:27:10	22:00:00	05:02:18	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:32:01
Nov	30	16:57:13	07:26:04	14:28:51	22:00:00	05:02:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:33:13
Dic	1	16:56:47	07:27:14	14:30:27	22:00:00	05:03:13	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:34:23
Dic	2	16:56:24	07:28:24	14:32:00	22:00:00	05:03:36	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:35:33
Dic	3	16:56:03	07:29:32	14:33:29	22:00:00	05:03:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:36:41



Dic	4	16:55:45	07:30:38	14:34:53	22:00:00	05:04:15	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:37:47
Dic	5	16:55:29	07:31:43	14:36:14	22:00:00	05:04:31	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:38:52
Dic	6	16:55:16	07:32:47	14:37:31	22:00:00	05:04:44	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:39:56
Dic	7	16:55:06	07:33:49	14:38:43	22:00:00	05:04:54	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:40:58
Dic	8	16:54:59	07:34:49	14:39:50	22:00:00	05:05:01	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:41:58
Dic	9	16:54:54	07:35:48	14:40:54	22:00:00	05:05:06	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:42:57
Dic	10	16:54:52	07:36:44	14:41:52	22:00:00	05:05:08	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:43:53
Dic	11	16:54:53	07:37:39	14:42:46	22:00:00	05:05:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:44:48
Dic	12	16:54:56	07:38:32	14:43:36	22:00:00	05:05:04	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:45:41
Dic	13	16:55:02	07:39:23	14:44:21	22:00:00	05:04:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:46:32
Dic	14	16:55:11	07:40:12	14:45:01	22:00:00	05:04:49	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:47:21
Dic	15	16:55:22	07:40:59	14:45:37	22:00:00	05:04:38	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:48:08
Dic	16	16:55:36	07:41:44	14:46:08	22:00:00	05:04:24	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:48:53
Dic	17	16:55:53	07:42:26	14:46:33	22:00:00	05:04:07	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:49:35
Dic	18	16:56:13	07:43:06	14:46:53	22:00:00	05:03:47	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:50:15
Dic	19	16:56:35	07:43:44	14:47:09	22:00:00	05:03:25	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:50:53
Dic	20	16:56:59	07:44:20	14:47:21	22:00:00	05:03:01	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:51:29
Dic	21	16:57:27	07:44:53	14:47:26	22:00:00	05:02:33	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:52:02
Dic	22	16:57:56	07:45:24	14:47:28	22:00:00	05:02:04	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:52:33
Dic	23	16:58:29	07:45:52	14:47:23	22:00:00	05:01:31	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:53:01
Dic	24	16:59:03	07:46:18	14:47:15	22:00:00	05:00:57	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:53:27
Dic	25	16:59:40	07:46:42	14:47:02	22:00:00	05:00:20	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:53:51
Dic	26	17:00:20	07:47:03	14:46:43	22:00:00	04:59:40	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:12
Dic	27	17:01:02	07:47:21	14:46:19	22:00:00	04:58:58	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:30
Dic	28	17:01:46	07:47:36	14:45:50	22:00:00	04:58:14	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:45
Dic	29	17:02:32	07:47:49	14:45:17	22:00:00	04:57:28	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:54:58
Dic	30	17:03:21	07:48:00	14:44:39	22:00:00	04:56:39	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:09
Dic	31	17:04:12	07:48:08	14:43:56	22:00:00	04:55:48	00:00:00	00:30:00	01:30:00	06:00:00	06:00:00	01:55:17





## Ciclo di regolazione CR2

Essendo la tabella degli orari di sorgente tramonto e di ciascuno step di regolazione identici alla soluzione CR1 si riportano solo i risultati finali:

Acc./Spegn. Ritardo sul Tramonto*		Durata Illuminazione annua		Durata Fase non Regolata		Durata Regolazione Fase 1		Durata Regolaz. Fase 2	Durata Fase non Regolata
00:15:00	min	4113	ore	1229	ore	730	ore ore	2024	217
Anticipo sull'Alba*		W Installati		1° Step % Riduzione		2° Step % Riduzione			
00:15:00	min	100		30,00		50,00			

Totale PRIMA kWh	419 991
Totale DOPO kWh	296 883
Differenza kWh	123 108
Risparmio %	29,3