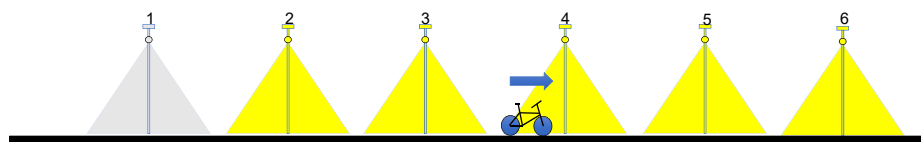




Azienda Elettrica di Massagno SA

## Telegestione e «dimming attivo» sulla pista ciclabile Tesserete-Canobbio



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1



Azienda Elettrica di Massagno SA

## AEM – Azienda Elettrica di Massagno

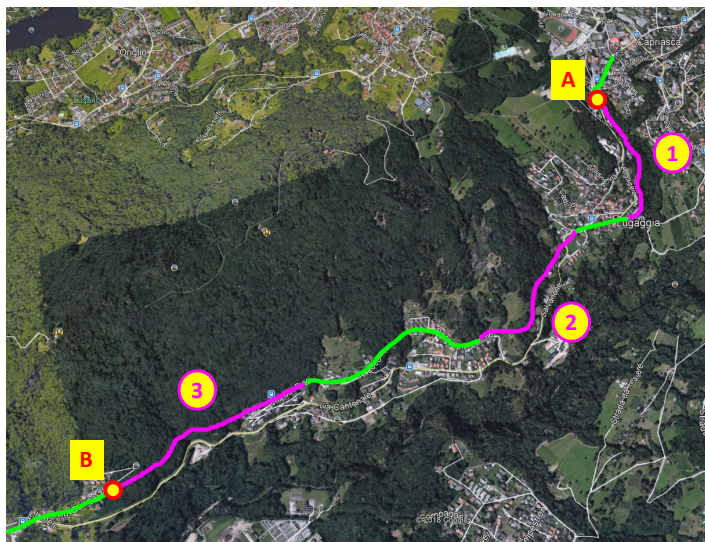
- Comprensorio:
  - Comune di Massagno
  - Comune di Capriasca
  - Comune di Isole
- Nr. Punti Luce: 2300
- Dal 2013 nuovi punti luce solo LED
- Attualmente 30% LED
- Entro il 2024 99% LED



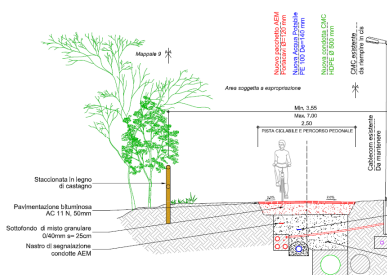
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2

## Il Progetto – Dati Principali



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- 3 km totali (A->B)
- 2.1 km da realizzare in tre tappe (1-2-3)
- 60 punti luce nel bosco
- Cat. Illuminazione S5

3

## Nel bosco: Illuminare oppure NO?

- Aspetti da considerare
  - Sicurezza (sensazione di sicurezza e sicurezza stradale)
  - Fauna
  - «Confort»
  - Fruttori
- Due varianti proposte
  - Variante «economica»
  - Variante «ecologica»

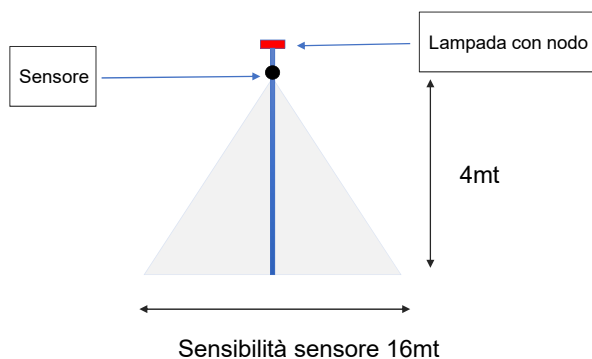


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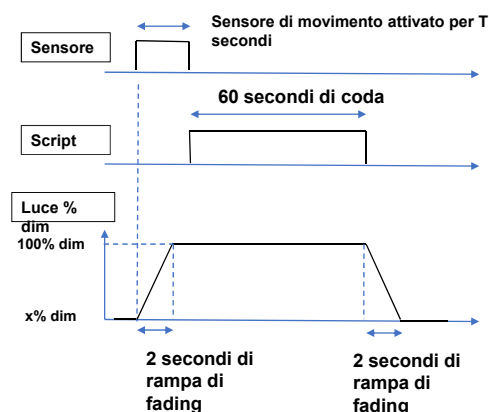
## La scelta: Variante «ecologica»

- Minor impatto sulla fauna
- Minor consumo energetico
- Maggiore sicurezza
- Maggior costi d'investimento (ca. 300-400 CHF preventivati, ca. 200.- effettivi)

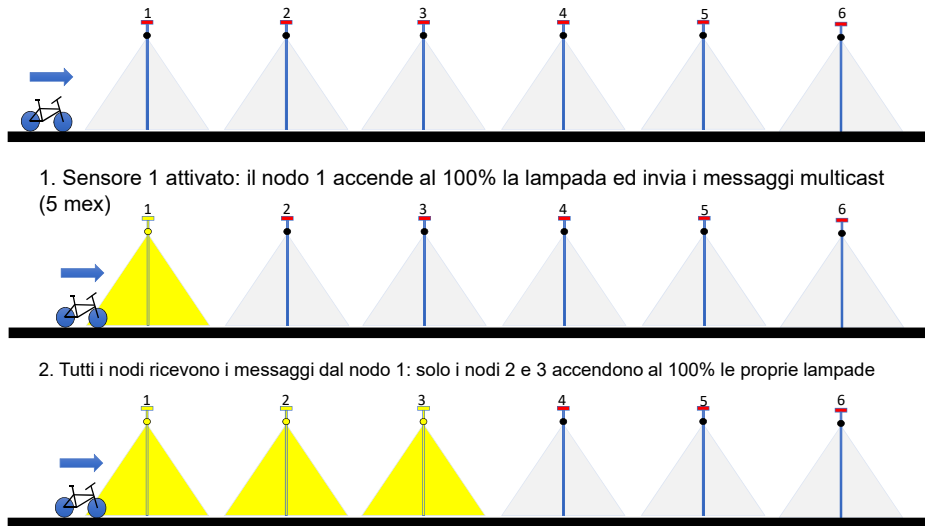


## Funzionamento

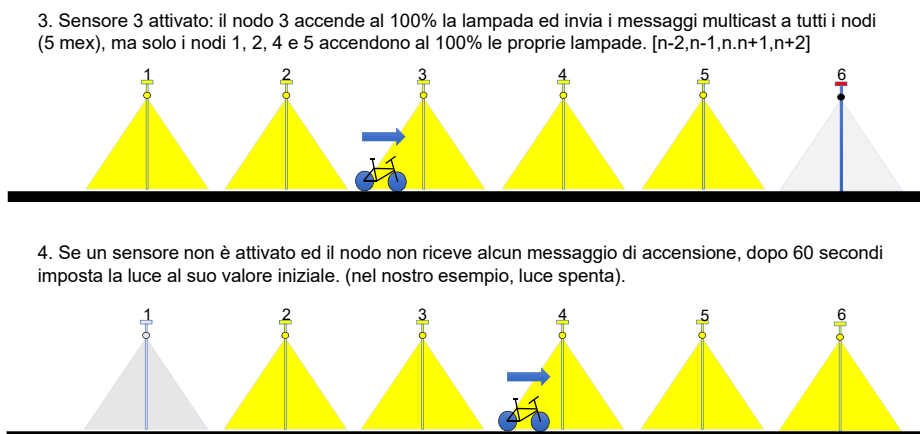
- Ciascun nodo è collegato ad un sensore di movimento. Se un movimento è osservato dal nodo  $n$ , questo manda un messaggio multicast a tutti i nodi e solo i due nodi precedenti ( $n-2$  e  $n-1$ ) e successivi ( $n+1$  e  $n+2$ ) eseguono il comando di accensione luci al 100% con un fading di 2 secondi.



## Funzionamento



## Funzionamento

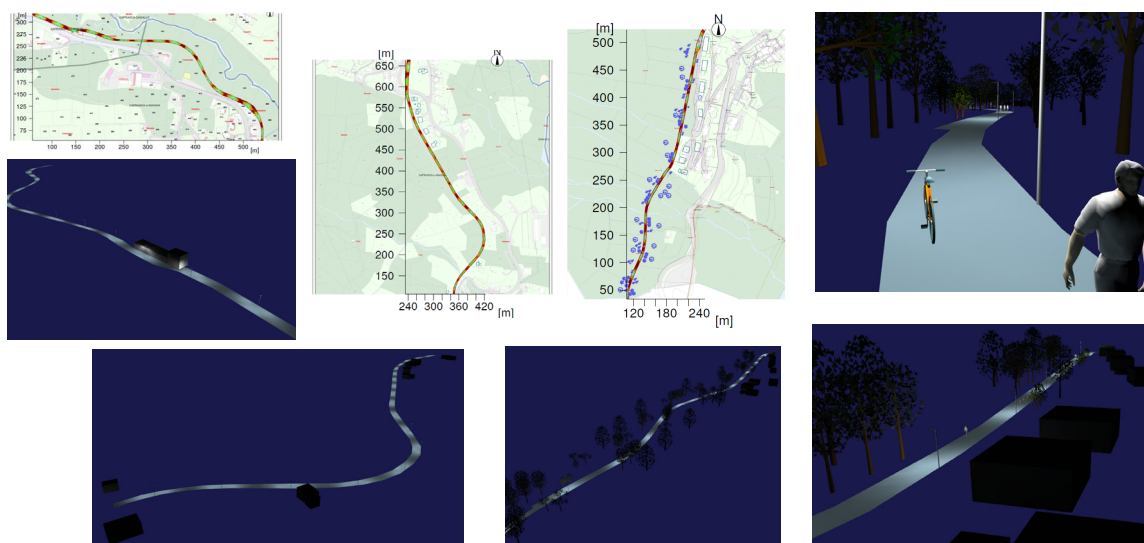


## Consumi - Costi

- **Gestione Attiva**
  - 600 ore di accensione anno (- 86%)
  - 1 anno 9.6 kWh
  - 1.56 CHF/anno per punto luce di elettricità
- **Gestione Standard**
  - 4'300 ore di accensione anno
  - 1 anno 68.8 kWh
  - 11.19 CHF/anno per punto luce di elettricità
- **Costi d'investimento**
  - Ca. 150'000.- CHF (2'500.- a punto luce)
  - 1/3 GC; 2/3 parte elettromeccanica



## Calcoli e Simulazioni





# Sistema di Telegestione Paradox CMS



The screenshot shows the Paradox CMS interface. On the left, there is a tree view of light fixtures under 'AEM Capriata'. The main area displays a map of Bellinzona with numerous light fixture icons. A control panel on the left includes a 'Light Control' section with an 'OFF' button and an 'Apply' button. Below it, a 'Measures' table shows real-time data:

Measure	Value
Active Energy	Wh
Reactive Energy	VAh
Active Power	W
Reactive Power	VAr
VRMS (Line Voltage)	V
IRMS (Line Current)	mA
Line Frequency	Hz

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# Sistema di Telegestione Paradox CMS



The screenshot shows the Paradox CMS interface with a detailed view of a specific light fixture. The control panel on the left shows a slider set to 0% and an 'Apply' button. The 'Measures' table shows:

Measure	Value
Active Energy	18'952 Wh
Reactive Energy	-5'969 VAh
Active Power	0 W
Reactive Power	0 VAr
VRMS (Line Voltage)	243 V
IRMS (Line Current)	13 mA
Line Frequency	50 Hz

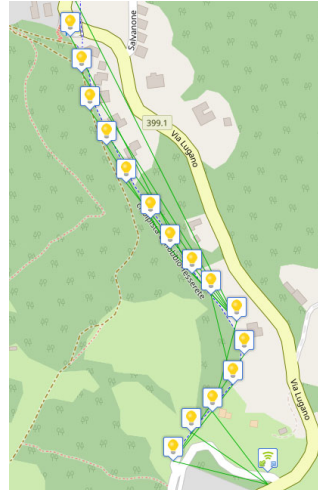
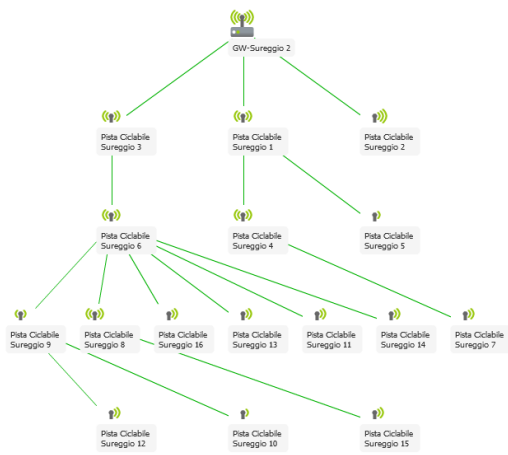
The main area shows a map with a callout window for 'Pista Ciclabile Lugaggia 10' (Node Type: LM DALI Light ID: 1409017). The callout window displays the following data:

Field	Value
Status	OFF
TimeStamp	11/01/2019 15:10:00
Active Energy	18'952 Wh
Reactive Energy	-5'969 VAh
Active Power	0 W
Reactive Power	0 VAr
VRMS (Line Voltage)	243 V
IRMS (Line Current)	13 mA
Line Frequency	50 Hz

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# Sistema di Telegestione Paradox CMS



# Sistema di Telegestione Paradox CMS

Pista Ciclabile Lugaggia 10

Live Data and Remote Control | Data Query and Export | Scenarios | DALI Device

From (Europe/Zurich) | 2019-01-09 | 15:08 | To 2019-01-10 | 9:00 | Search | CSV

TimeStmp (Europe/Zurich)	Act Wh	Reac VAh	PwrAct W	PwrReac VAcr	Line V	Line mA	Line Hz	Light Status
2019-01-09 18:30:00	18798	-954	0	0	241	13	49.9	0%
2019-01-09 18:30:00	18798	-954	16	-4	239	71	49.9	100%
2019-01-09 18:30:00	18798	-954	16	-4	239	71	49.9	100%
2019-01-09 18:40:00	18799	-954	16	-4	239	70	49.9	100%
2019-01-09 18:50:00	18701	-955	0	0	242	13	49.9	0%
2019-01-09 19:00:00	18702	-955	0	0	241	13	49.9	0%
2019-01-09 19:00:00	18702	-955	0	0	241	13	49.9	0%
2019-01-09 19:10:00	18702	-955	0	0	241	13	49.9	0%
2019-01-09 19:20:00	18702	-955	0	0	242	13	49.9	0%
2019-01-09 19:30:00	18704	-955	16	-4	239	70	50	100%
2019-01-09 19:40:00	18705	-956	0	0	240	13	50	0%
2019-01-09 19:50:00	18705	-956	0	0	239	13	49.9	0%
2019-01-09 20:00:00	18705	-956	0	0	239	13	49.9	0%
2019-01-09 20:10:00	18705	-956	0	0	243	13	49.9	0%
2019-01-09 20:20:00	18705	-956	0	0	242	13	49.9	0%
2019-01-09 20:30:00	18705	-956	0	0	241	13	49.9	0%
2019-01-09 20:40:00	18707	-956	0	0	242	13	49.9	0%
2019-01-09 20:50:00	18707	-956	0	0	242	13	49.9	0%
2019-01-09 21:00:00	18708	-957	0	0	241	13	49.9	0%
2019-01-09 21:10:00	18708	-957	16	-4	240	70	49.9	100%
2019-01-09 21:20:00	18709	-957	0	0	242	13	49.9	0%
2019-01-09 21:30:00	18709	-957	0	0	243	13	49.9	0%
2019-01-09 21:40:00	18709	-957	0	0	242	13	49.9	0%
2019-01-09 21:50:00	18709	-957	0	0	243	13	49.9	0%
2019-01-09 22:00:00	18709	-957	0	0	240	13	50	0%





# Sistema di Telegestione Paradox CMS

Pista Ciclabile Sureggio 9

Live Data and Remote Control | Data Query and Export | Scenarios

From (Europe/Zurich) 2018-06-15 15:00 To 2018-06-16 9:00 Search CSV

TimeStamp (Europe/Zurich)	Act Wh	Reac VAh	PerAct W	PerReac VAh	Line V	Line mA	Line Hz	Light Status
2018-06-15 22:30:00	42456	-12185	0	0	241	12	49.6	0%
2018-06-15 22:40:00	42458	-12186	14	-4	241	69	49.9	100%
2018-06-15 22:50:00	42459	-12186	16	-4	241	69	50	100%
2018-06-15 23:00:00	42461	-12187	0	0	242	12	49.9	0%
2018-06-15 23:10:00	42461	-12187	16	-4	241	69	49.9	100%
2018-06-15 23:20:00	42463	-12187	16	-4	241	69	50	100%
2018-06-15 23:30:00	42463	-12187	16	-4	242	69	49.9	100%
2018-06-15 23:40:00	42464	-12188	0	0	242	12	49.9	0%
2018-06-15 23:50:00	42464	-12188	0	0	240	12	49.9	0%
2018-06-16 00:00:00	42465	-12188	0	0	240	12	50	0%
2018-06-16 00:10:00	42466	-12188	0	0	240	12	49.9	0%
2018-06-16 00:20:00	42466	-12188	0	0	239	12	50	0%
2018-06-16 00:30:00	42466	-12188	0	0	240	12	49.9	0%
2018-06-16 00:40:00	42467	-12189	0	0	240	12	49.9	0%
2018-06-16 00:50:00	42467	-12189	0	0	241	12	50	0%
2018-06-16 01:00:00	42468	-12189	0	0	240	12	49.9	0%
2018-06-16 01:10:00	42468	-12189	0	0	240	12	49.9	0%
2018-06-16 01:20:00	42468	-12189	0	0	240	12	49.9	0%
2018-06-16 01:30:00	42468	-12189	0	0	240	12	49.9	0%
2018-06-16 01:40:00	42469	-12189	0	0	241	12	49.9	0%
2018-06-16 01:50:00	42469	-12189	0	0	241	12	49.9	0%
2018-06-16 02:00:05	42469	-12189	0	0	241	12	49.9	0%
2018-06-16 02:10:00	42469	-12189	16	-4	241	70	49.9	100%
2018-06-16 02:20:00	42470	-12189	0	0	242	12	49.9	0%
2018-06-16 02:30:00	42470	-12189	0	0	241	12	49.9	0%

Measures: 109 Total consumption: 30 Wh



# Sistema di Telegestione Paradox CMS



Lamp Type Energy Report

CSV Print Select month All years All months Day Week Month

Show 50 entries

Search:

Showing 1 to 25 of 32 entries

Month	Lamp Type Name	Active lamps	Tot. Working hours	Avg Working hours	Tot. Consumption (Wh)
2019/1	Lampade pista ciclabile AEM	52	1853.18	36.26	38472
2018/9	Lampade pista ciclabile AEM	48	1794.60	37.39	27573
2018/8	Lampade pista ciclabile AEM	49	2095.62	43.30	31734
2018/7	Lampade pista ciclabile AEM	49	1685.32	34.39	25443
2018/6	Lampade pista ciclabile AEM	49	1586.40	32.38	24104
2018/5	Lampade pista ciclabile AEM	49	1044.70	21.32	16031
2018/4	Lampade pista ciclabile AEM	49	986.18	20.13	15381
2018/3	Lampade pista ciclabile AEM	49	1571.70	32.08	24969
2018/2	Lampade pista ciclabile AEM	49	2182.25	44.54	34662
2018/12	Lampade pista ciclabile AEM	51	6001.42	117.67	124021
2018/11	Lampade pista ciclabile AEM	51	3936.47	78.77	84554
2018/10	Lampade pista ciclabile AEM	49	2653.65	54.35	55056
2018/1	Lampade pista ciclabile AEM	49	2689.23	61.49	42453
2017/9	Lampade pista ciclabile AEM	50	2011.12	40.22	30644



# Sistema di Telegestione Paradox CMS

Lamp Type Energy Report

 CSV  Print  All years   Day  Week  Month
Show  entriesSearch: 

Showing 451 to 475 of 899 entries

Date	Lamp Type Name	Active lamps	Tot. Working hours	Avg Working hours	Tot. Consumption (Wh)
2018-12-12	Lampade pista ciclabile AEM	51	230.33	4.52	4575
2018-12-13	Lampade pista ciclabile AEM	51	225.03	4.41	4491
2018-12-14	Lampade pista ciclabile AEM	51	238.32	4.61	4655
2018-12-15	Lampade pista ciclabile AEM	51	229.07	4.49	4565
2018-12-16	Lampade pista ciclabile AEM	51	220.85	4.33	4417
2018-12-17	Lampade pista ciclabile AEM	51	245.80	4.82	4948
2018-12-18	Lampade pista ciclabile AEM	51	191.08	3.75	3967
2018-12-19	Lampade pista ciclabile AEM	51	133.62	2.62	2757
2018-12-20	Lampade pista ciclabile AEM	51	149.87	2.94	3376
2018-12-21	Lampade pista ciclabile AEM	51	158.90	3.12	3424
2018-12-22	Lampade pista ciclabile AEM	51	152.18	2.98	3366
2018-12-23	Lampade pista ciclabile AEM	51	151.47	2.97	3348
2018-12-24	Lampade pista ciclabile AEM	51	162.03	3.18	3500
2018-12-25	Lampade pista ciclabile AEM	51	141.62	2.78	3155
2018-12-26	Lampade pista ciclabile AEM	51	127.22	2.49	2973
2018-12-27	Lampade pista ciclabile AEM	51	151.42	2.97	3360
2018-12-28	Lampade pista ciclabile AEM	51	149.88	2.94	3312
2018-12-29	Lampade pista ciclabile AEM	51	129.65	2.54	3002
2018-12-30	Lampade pista ciclabile AEM	51	151.52	2.97	3321
2018-12-31	Lampade pista ciclabile AEM	51	136.58	2.68	3230

Previous 1 18 19 20 36 Next

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# Alcune fotografie - 1



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## Alcune fotografie - 2



## Video





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Grazie per la vostra  
attenzione



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Domande?



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