

## Energy efficient lightning systems

ECSLA Cold Chain Logistics Conference



Madrid / Spain - October 15-16, 2012



## Survey at Leen Menken cold stores NL

- ✿ Spread sheet with all lighting's and hours in use
- ✿ Measurement real hours need for lighting
- ✿ Energy for cooling lamp heat
  - for frozen storages 52%
  - for chilled storages 27%



## Different types of rooms

- ✿ 15 meters high frozen storage with mobile racks
- ✿ 15 meters high frozen storage with order picking
- ✿ 9 meters high frozen storage with mobile racks
- ✿ 4 meters high frozen order picking room
- ✿ 4 meters high chilled loading area

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Oude situatie tot en met 2011										Leen Menken FOODSERVICE LOGISTICS		Verlichtingsplan			
Ruimte:	Temp:	Koel- factor:	Aantal armaturen:	Lichtbron:	Aantal:	Opgenomer Verm. (W):	Aantal weken:	Uren p/w:	Verlichting: kWh/jaar:	energiekosten verlichting:	Koeling kWh/jaar:	energiekosten koeling:			
Cel 1	-20	0,65	40	HPL	1	266	52	80	44.262	13.847,36	28.771	12.500,78			
Cel 2	+4	0,36	40	HPL	1	266	52	80	44.262	13.847,36	15.934	11.385,05			
Cel 3	+4	0,36	23	TL	2	58	52	60	8.324	1723,55	2.937	1260,48			
Cel 4	-20	0,65	28	Halogeen	1	1000	52	10	14.560	11.265,58	3.464	1822,63			
Cel 4	-20	0,65	16	HPL	1	425	52	80	28.288	12.458,84	18.387	11.536,25			
Cel 5	-20	0,65	28	Halogeen	1	1000	52	10	14.560	11.265,58	3.464	1822,63			
Cel 5	-20	0,65	16	HPL	1	425	52	80	28.288	12.458,84	18.387	11.536,25			
Cel 6	-20	0,65	32	TL	2	58	52	80	15.442	11.342,24	10.037	1872,45			
Cel 7	-20	0,65	29	TL	2	58	52	60	10.436	1312,30	6.822	1535,00			
Cel 8	-20	0,65	26	TL	2	58	52	60	9.410	1817,93	6.116	1531,65			
Tunnel 1	+4	0,36	6	TL	2	58	52	5	181	115,73	65	15,66			
Tunnel 2	-20	0,65	8	Halogeen	1	400	52	10	1.664	1144,64	1.082	194,01			
Expeditie 1	+4	0,36	24	TL	2	58	52	100	14.477	11.258,35	5.212	1453,00			
Expeditie 2	+4	0,36	24	TL	2	58	52	100	14.477	11.258,35	5.212	1453,00			
Expeditie 3	+4	0,36	4	HPL	1	425	52	100	8.840	1768,39	3.182	1276,62			
Expeditie 4	+4	0,36	34	TL	2	58	52	100	20.509	11.782,66	7.383	1641,76			
Bordes	+4	0,36	4	TL	2	58	52	60	1.448	1125,83	521	145,30			
Cel 11 gang	-20	0,65	11	HPL	1	425	52	80	19.448	11.630,45	12.641	11.098,79			
Cel 11 paden	-20	0,65	12	HPL	1	425	52	80	21.216	11.844,13	13.790	11.198,68			
Cel 12	-20	0,65	44	Halogeen	1	1000	52	12,5	28.600	12.485,96	18.530	11.615,87			
Cel 12	-20	0,65	11	HPL	1	425	52	100	24.310	12.113,07	15.802	11.373,49			
Expeditie 1	+4	0,36	6	TL	2	58	52	110	3.981	1.346,05	1.433	1124,58			
Expeditie 1	+4	0,36	18	TL	2	58	52	110	11.943	11.038,14	4.300	1373,73			
Terugkoelen lampw armte vries										388.386	133.811,30	215.593	18.739,67		
Terugkoelen lampw armte koel													133.811,30		
Voorschakel HPL 400W													*****		
Voorschakel HPL 250W															
Energieprijs per kWh													604.579		



## 15 meters high frozen storage with order picking

Old situation: 23 x HPL 425 W

2 shift operation 80 hours per week  
energy use 67.000 kWh per year

New situation: 23 x LED 108 W with movement sensors

2 shift operation 80 hours per week  
energy use 14.500 kWh per year



## 9 meters high frozen storage with mobile racks

Old situation: 40 x HPL 266 W  
2 shift operation 80 hours per week  
energy use 73.000 kWh per year

New situation: 20 x LED 108 W with movement sensors  
2 shift operation 80 hours per week  
energy use 5.100 kWh per year

## 4 meters high frozen order picking room

Old situation: 29 x TL 116 W  
2 shift operation 80 hours per week  
energy use 17.300 kWh per year





New situation: 29 x LED 22 W with movement sensors  
2 shift operation 80 hours per week  
energy use 1.500 kWh per year

## 4 meters high chilled loading area

Old situation: 82 x TL 116 W  
2 shift operation 100 hours per week  
energy use 67.000 kWh per year

New situation: 82 x LED 22 W with movement sensors  
2 shift operation 100 hours per week  
energy use 6.300 kWh per year

## Total energy use old/new

- Old situation:
  -  Energy use for lighting 390.000 kWh
  -  Energy use for cooling lamp heat 216.000 kWh
  - Total energy use 606.000 kWh**
- New situation:
  -  Energy use for lighting 41.500 kWh
  -  Energy use for cooling lamp heat 18.500 kWh
  - Total energy use 60.000 kWh**

## Selection challenges

- ⚙️ How many lux do you need?
- ⚙️ Spread angle of the light?
- ⚙️ Selection of the right product
- ⚙️ Selection of the right supplier
- ⚙️ ROI: how many years is acceptable?

