



Gradis Flagship Projects:

1. Kraków (Proof-of-Concept)

- Gradis Design and Asset Management covers 3741 lighting points,
- Designs made both for Schreder and GE lighting fixtures
- Each design made for all lighting classes according EN 13201 norm
- Dynamic control system is integrated with sensors (induction loop)
- When traffic intensity decreases (measured at 15 minutes intervals), the parameters of the lower lighting classes are applied (please note: other dynamic control systems apply luminary dimming, which is not EN 13201 norm compliant)
- Infrastructure functionality of more than three years
- Dynamic control gives an additional 10% reduction of energy consumption, ultimately providing 81% energy efficiency compared to the old infrastructure.

2. Tbilisi

- Gradis won an international tender to prepare the lighting master plan for the entire city with an estimated 100,000 lighting points
- The final project included 90239 luminaries (the remaining lighting points were park luminaries, which are outside of the project scope)
- Tbilisi Master Plan Project has proven the scalability of our solution
- Elapsed time for the full computation for the entire city was less than 10 hours for one vendor
- The final project design was calculated to include four different vendors.

3. Bytom, Poland

- City with 9803 lighting points.
- Ownership of the infrastructure is split between the city (1800 lighting points) and energy operator Tauron (remaining infrastructure). Gradis provided analysis supporting the optimal, consensus-based decision
- Initially, a few variants of modernization were calculated,
- Finally, the rolling modernization analysis provided:
 - Investment Period of 10 years at 1000 luminaires per year
 - The 10-year OPEX between the best and the worst scenario differs by 44%
 - The optimal OPEX scenario (with consideration of some practical implementation constrains) differs from the worst scenario by 32%
 - The value of the 10-year OPEX exceeds the CAPEX value by 13%

4. Washington DC

- We accessed open-source data provided by the city
- Data cleaning algorithms accepted 54,146 of 57,011 lighting points. The rest were checked manually.
- For 40.5 thousand of luminaries, the system automatically provided the correct design according to US norm **RP-8**; for the remaining 13.5 thousand, faults found deficiencies such as excess distance between poles or poles which are too low
- The effectiveness of the ultimate retrofit design was 83%
- The result was nearly the same for the European EN 13201 norm.
- The total calculation time for the two (US & European) norms, and few different families of luminaries, including data cleaning took us less than one week

Gradis Projects for Polish Cities.

Gradis also prepared several audit and design type projects for Polish cities:

Zabrze (3971 lighting points; Initial power 591,4 kW, Power after retrofit 280,1 kW, Power savings: 67%)

Zgorzelec (2287 lighting points; Initial power: 179,50kW, Power after retrofit: 58,84 kW, Power savings: 69%)

Polkowice 1 (1030 lighting points; Initial power: 128 200 W, Power after retrofit 41 300 W, Power savings: 68%)

Nowy Sącz (2313 lighting points; Initial power: 419,1 kW, Power after retrofit: 153,6 kW, Power savings: 76%)

Myszków 1 (506 lighting points; Initial power: 64,8 kW, Power after retrofit: 16,9 kW, Power savings: 74%) + MASTERPLAN

Myszków 2 (186 lighting points; Initial power: 17,1 kW, Power after retrofit: 5,9 kW, Power savings: 66%) + MASTERPLAN

Piaseczno (11 205 lighting points, Initial power: 37,39kW, Power after retrofit: 14,60kW, Power savings: 61%)

Lubin (2619 lighting points; Initial power: 331,59 kW, Power after retrofit: 113,80 kW, Power savings: 66%)

Polanica (1014 lighting points; Initial power: 159,15kW, Power after retrofit: 21,38kW, Power savings: 87%)

Polkowice 2 (347 lighting points; Initial power: 44,88kW, Power after retrofit: 13,23kW, Power savings: 71%)

Zgorzelec 2 (1674 lighting points; Initial power: 179,50kW, Power after retrofit: 58,84 kW, Power savings: 69%)

Jawor (581 lighting points; in progress)

Legnica (3700 lighting points; in progress)

Zawidów (498 lighting points; Initial power: 37,39kW, Power after retrofit: 14,60kW, Power savings: 61%)

Złoty Stok 1 (27 lighting points; Initial power: 2kW, Power after retrofit: 0,62 kW, Power savings: 31%)

Złoty Stok 2 (886 lighting points; in progress)

Ząbkowice Śląskie (2067 lighting points; Initial power: 172,17kW, Power after retrofit: 54,85kW, Power savings: 68%)

Środa Śląska (867 lighting points; Initial power: 85,42kW, Power after retrofit: 25,35kW, Power savings: 70%)

Myślenice (2759 lighting points; Initial power: 271,9 kW, Power after retrofit: 91,7kW, Power savings: 69%) + MASTERPLAN

Gradis Projects with Polish Utility Company Tauron.

Gradis was awarded three audit and design projects by Tauron:

Michałowice (1932 lighting points, in progress)

Wilkowice (1449 lighting points, in progress)

Wadowice (3759 lighting points; Initial power: 450,63 kW, Power after retrofit: 133,7kW, Power savings: 70%) + Masterplan

In October 2020, Gradis won the tender for **18 locations** (18,527 lighting points; projects in progress):

1. Brzesko,
2. Ciężkowice,

3. Gromnik,
4. Lisia Góra,
5. Pleśna,
6. Radłów,
7. Ryglice,
8. Rzepiennik Strzyżewski,
9. Skrzyszów,
10. Szerzyny,
11. Tarnów,
12. Tuchów,
13. Wierzchosławice,
14. Wietrzychowice,
15. Wojnicz,
16. Zakliczyn,
17. Żabno,
18. Radomyśl Wielki

Gradis Projects with Luminary Vendors

1. **GE Lighting** - formal agreement
 - Paid one design 3,741 point
2. **Schreder** - formal agreement
 - Paid 75 designs for 134,171 lighting points
 - Calculation based on Schreder luminaries include Tbilisi, Washington DC, and Lvov
3. **Signify** - Nine designs
 - Calculations for Bytom 10,000 points
 - Initiated talks regarding CIS, Ukraine, and Georgia
4. **Everlight**
 - Calculations for project in Kraków
5. **Rosa** - Four designs
 - Calculations for Nowy Sącz
6. **Thorn** - Four designs
 - Calculations for Wadowice
7. **LUG** - Three designs
 - Calculations for Zgorzelec/Goerlitz
8. **Tungshram**
 - Long-term cooperation under discussion