

Powering streetlights in Hertfordshire

Solar & Wind Generation and Results from the pilot



Hertfordshire Map



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Hertfordshire: Context and Journey so far

- Circa 116,500 streetlights
- Introduction of Part Night Lighting (PNL) in 2012
- Phased rollout of Light Emitting Diode (LED) Lanterns and Central Management System (CMS) from 2014 to 2021 (CIHT Sustainability Award Winner 2017: From PFI to LED)
- Two lighting regimes: (i) PNL (switch on at dusk, dimmed by 50% at 21.00 until 23.00, dimmed by further 30% through to 01.00, switch off until 05.00, switch on at 05.00 until dawn) - circa 65% and (ii) Full Night Lighting (FNL, switch on at dusk, dimmed by 25% between 23.00 and 06.00) - circa 35%, of streetlights
- Reduction in: Energy consumption (circa 53%), Carbon emissions (circa 77%) and Cost avoided (circa £8.8 million)
- Current annual energy bill circa £6 million (streetlights: circa £5 million, signals & signs: circa £1 million)
- **Commitment to Sustainable Hertfordshire Strategy & Action Plan - Solar & Wind street lighting pilot trial started 2022 and ongoing**

Solar & Wind Powered Electrical Generation (Off-Grid)

- Pilot trial being undertaken on four remote footway sites within Hertfordshire
- Locations selected from residents' suggestions and officers' knowledge
- All neighbouring properties contacted prior to installation
- UK based manufacturer: column, LED lantern, solar & wind units, battery & CMS
- No trenching, cabling or connection to the electrical distribution network
- Monitoring & evaluation over whole year (variation in daylight / sun hours)

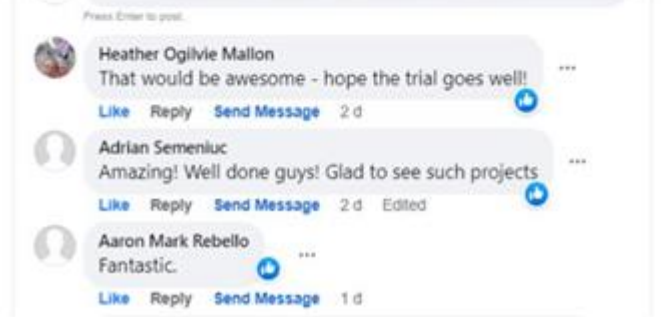


Corner View, Night

www.hertfordshire.gov.uk

On the Highways social media channels our news about the wind and solar lights was received very well. Everyone is very pleased about the project, customers are wishing us well and everything!

We've just started our first #solar and #wind-powered street lighting trial in #WelhamGreen #Hatfield - this lighting requires no energy consumption or carbon emissions! To read more about this visit our website: <https://bit.ly/3HEWHss>



Corner View, Day

Solar & Wind Powered Electrical Generation (Off-Grid)

Friars Road

Jessops Road

Park Road



Day

Night

Day

Night

Day

Night

Results from the pilot trial

- Initial comparison: conventional and solar & wind street lighting units (both five metre high steel lighting columns & LED lanterns operating to FNL regime): Capital installation costs (ducting, trenching & connection to grid v. solar panel, wind turbine & battery) are comparable; Overall Revenue maintenance and operating costs are lower for solar & wind - no electrical inspection & testing (both street lighting columns subject to structural inspection & testing), operates with zero energy (from grid) consumption and associated zero carbon emissions
- Adverse feedback from one resident regarding aesthetics of the wind turbine unit (although silent in operation), but in the main welcomed by residents. One site adapted to solar only, operating to PNL regime, monitoring lighting performance and battery power storage sustainability over whole year
- Minor technical issues regarding the reliability and functioning of the batteries, since resolved with new (silicone graphite) batteries (design life circa 25 years, similar design life for columns and LED lanterns)
- Work in progress regarding comparison of whole life cost, including CMS, maintenance of solar panels, wind turbines, embedded carbon and raw materials
- Overall, the solar & wind street lighting units are performing well. Monitoring & evaluation ongoing
- **Work in progress regarding interoperability between conventional CMS (230v A.C. platform), Confirm Asset Management and Highway Fault Reporting Systems and Off-Grid CMS (12v D.C. platform)**

Future

- Opportunity to incorporate as part of new Infrastructure supporting sustainable, responsible growth
- Opportunity for adaptation of existing infrastructure subject to technical viability (e.g., weight, windage and structural integrity), affordability, maintainability and sustainability
- Continue to keep watching brief on developments within the industry regarding suitable and appropriate solar & wind powered assets, procurement of green energy and the need for lighting (maintaining safety and accessibility whilst aligning with Sustainability Strategy) as referenced in Hertfordshire County Council's Highways Place & Movement Planning & Design Guide and Local Transport Plan 4 in supporting active, safe and sustainable travel
- **Ongoing mission to create a cleaner, greener and healthier Hertfordshire**
- **The Bigger Picture: Circa 8.2 million lighting units (including illuminated signs, source: Highway Electrical Yearbook) across UK. Renewables' (Wind, Solar, Hydro, Bioenergy & Waste) share of electricity generation was 50.5 per cent in Q.3 2024 in UK (source: Dept. for Energy Security & Net Zero). Opportunity to harness collective Public Sector purchasing power, economies of scale and consortia to drive innovation and support renewable energy, carbon neutral by 2030 and net zero greenhouse across the UK by 2050**

Thank you