

Energy Efficiency and Solar PV - Leisure Facilities

Wayne Bexton – Head of Energy Projects



@ClimateBex



Nottingham
City Council

**Energy Projects
Service**

NCC

The Energy Projects Service



NCC - Energy Projects Service

- Delivered over 11MW of Solar PV in the last 3 years.
- Renewable energy specialists.
- Sensible use of innovative technology delivering commercial returns.
- Energy investment programme management.
- Income generation and energy asset management.
- Leaders in the field - multiple industry award winners.
- Creating the future of energy generation and smart Infrastructure.



NCC - Project Delivery Capability

- MCS accredited delivery team.
- Project management and design software.
- Extensive solar panel supply framework.
- Grid connection expertise.
- Planning application knowledge.
- Installation engineer network.



NCC - Commercial Solar PV

- 37 Installations across the City.
- Target of 60 by 2019.
- Innovative installs: Solar Canopies.
- Delivered by in house MCS accredited workforce.



Minver Sports Centre

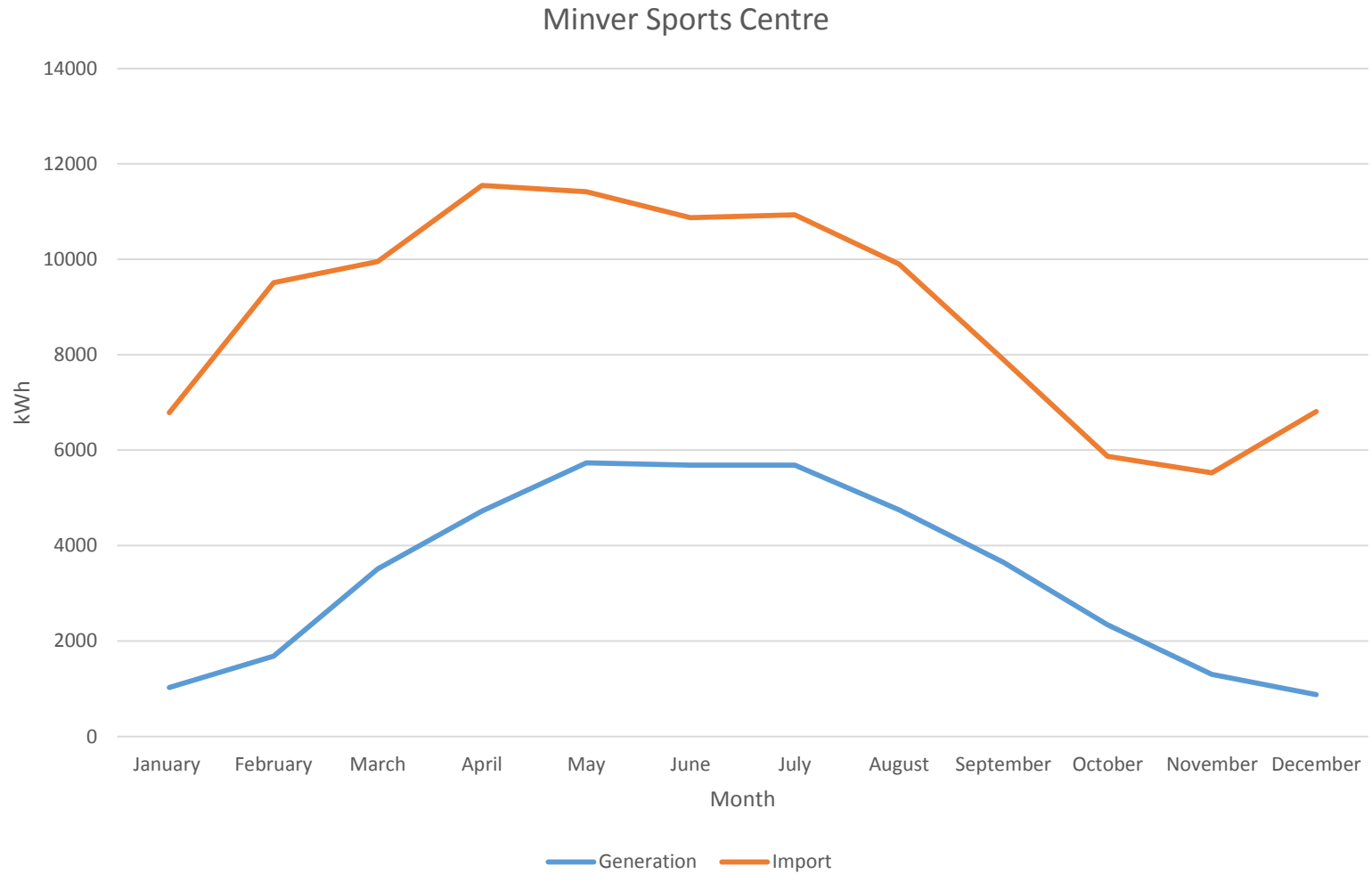
| | |
|----------------------------|--------|
| Total kWp | 49.02 |
| Estimated generation (kWh) | 40,966 |
| Carbon savings (kg's) | 18,783 |
| Number of panels | 172 |
| Area (m ₂) | 282 |
| ROI | 5.6% |



- Solar Edge technology
- 100% of energy generated is used on site



Generation v Import



Nottingham Tennis Centre

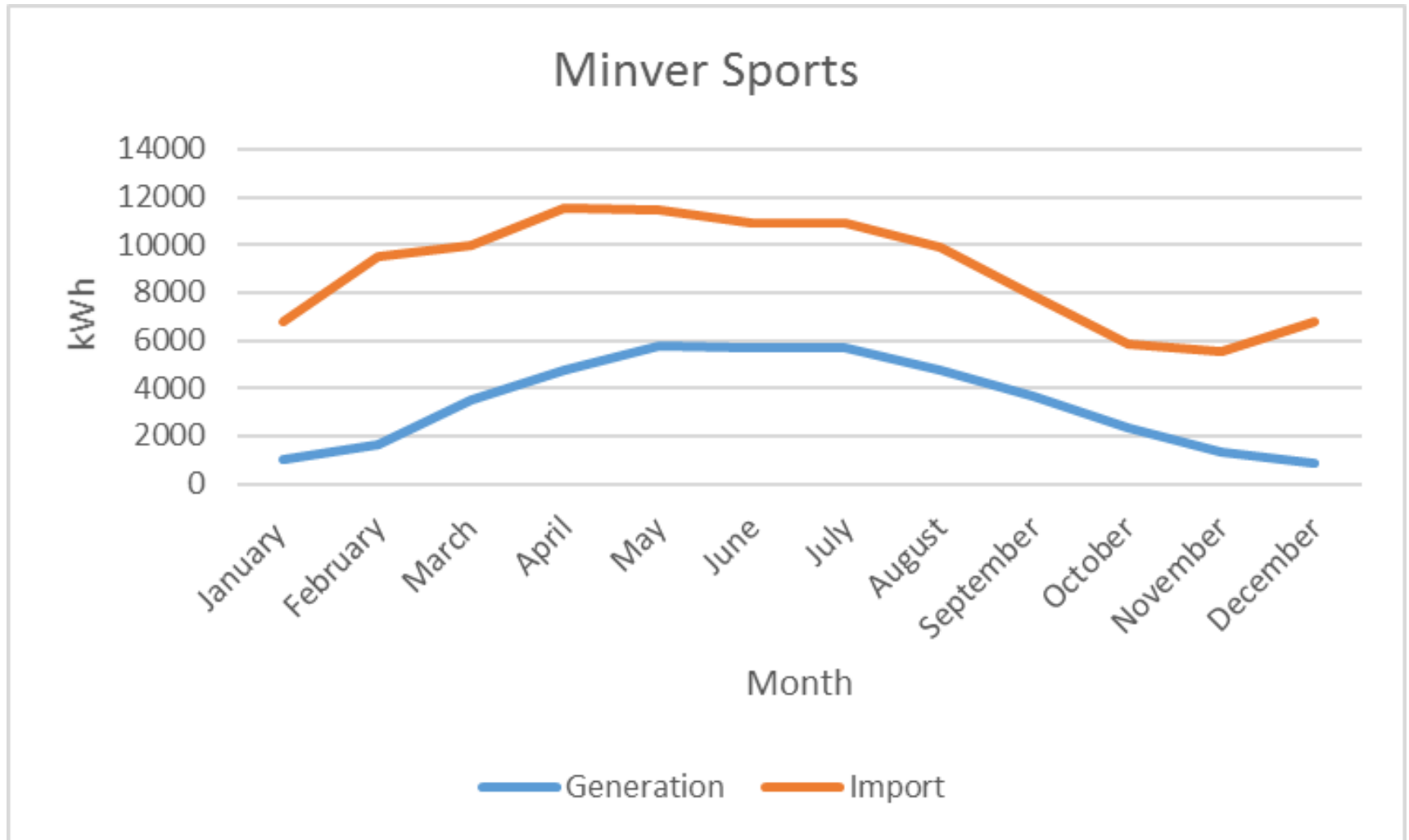
| | |
|----------------------------|---------|
| Total kWp | 151 |
| Estimated generation (kWh) | 118,832 |
| Carbon savings (kg's) | 62,000 |
| Number of panels | 600 |
| Area (m ₂) | 888 |
| ROI | 6.7% |



- 100% of energy generated is used on site
- 100% self sufficient during peak generating months

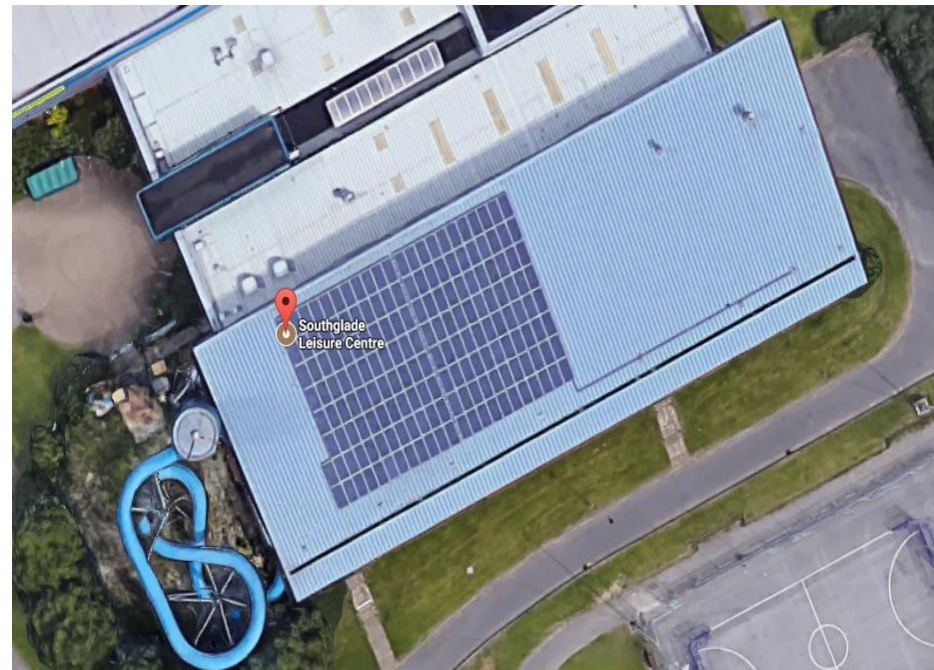


Generation v Import



Southglade Leisure Centre

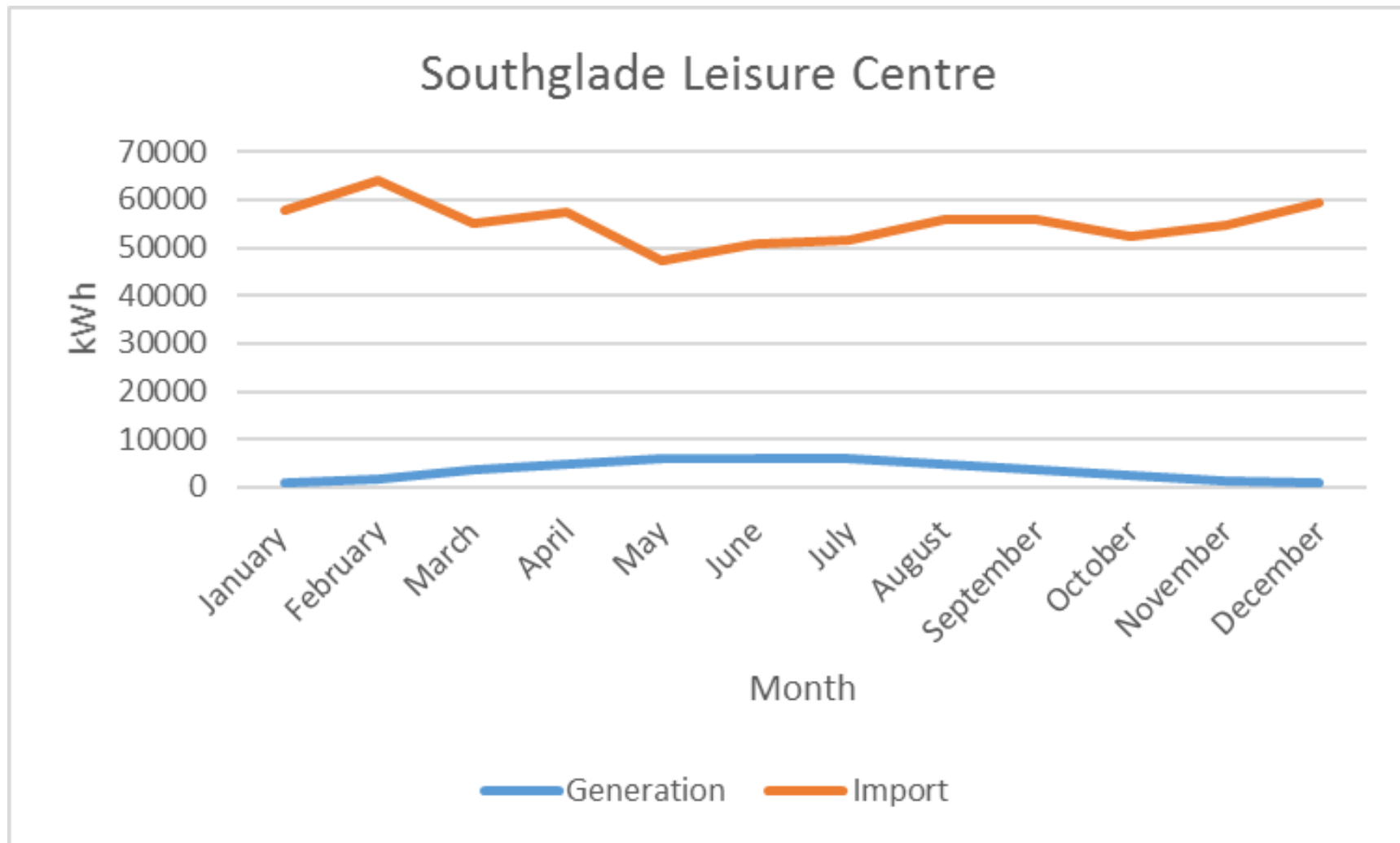
| | |
|----------------------------|--------|
| Total kWp | 49.28 |
| Estimated generation (kWh) | 42,430 |
| Carbon savings (kg's) | 19,454 |
| Number of panels | 176 |
| Area (m ₂) | 238 |
| ROI | 7.8% |



- 100% of energy generated is used on site
- Feasibility study taking place to install a further 50kWp of Solar PV



Generation v Import



Harvey Hadden Sports Village

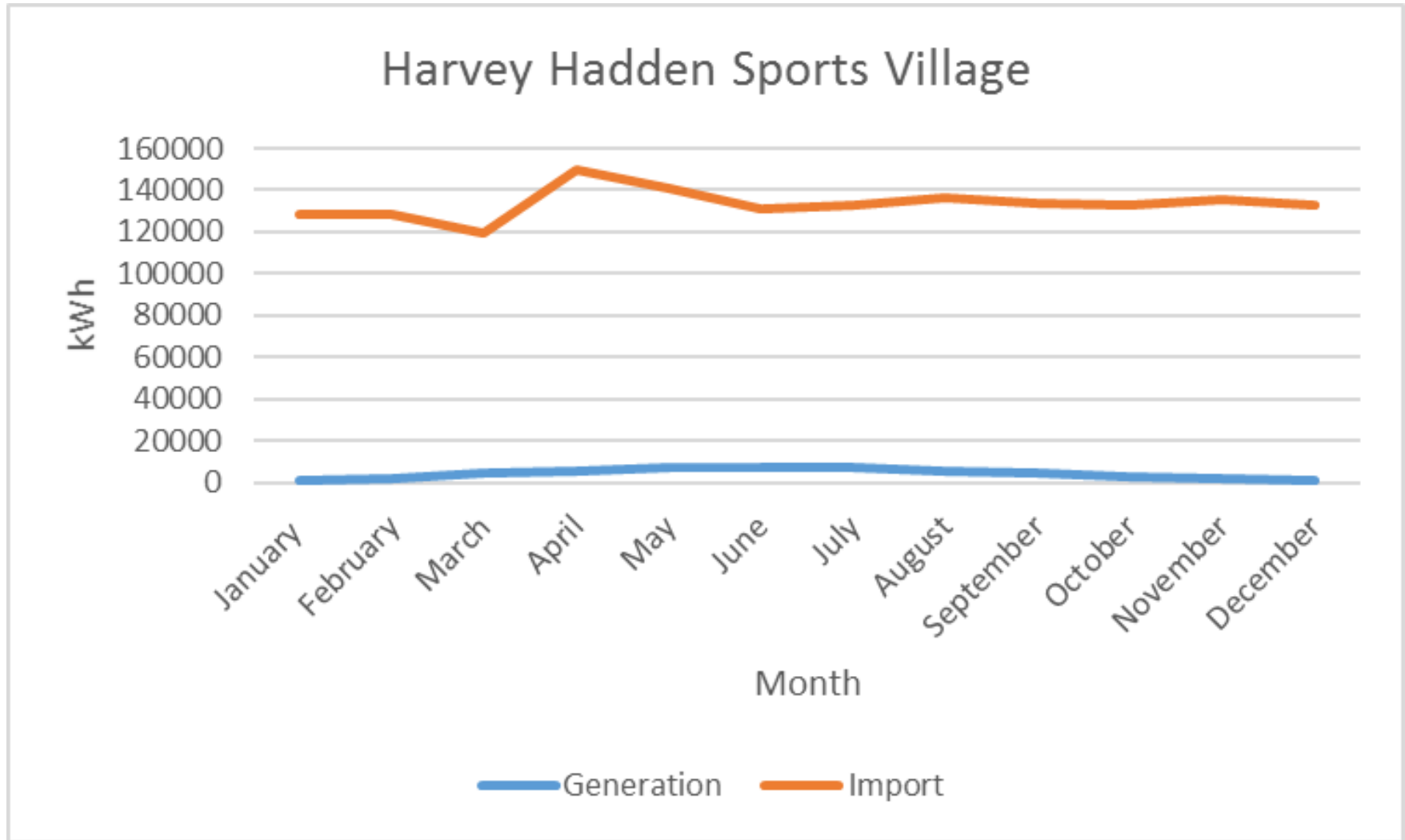
| | |
|----------------------------|--------|
| Total kWp | 67 |
| Estimated generation (kWh) | 50,722 |
| Carbon savings (kg's) | 28,650 |
| Number of panels | 448 |
| Area (m ₂) | 575 |
| ROI | 7.1% |



- Thin film modules
- 100% of energy generated is used on site
- UK's largest car port at the time of installation
- Innovation of the year award – Nottingham Evening Post Environmental Awards



Generation v Import



Ken Martin Leisure Centre

| | |
|----------------------------|--------|
| Total kWp | 88.5 |
| Estimated generation (kWh) | 79,874 |
| Carbon savings (kg's) | 36,622 |
| Number of panels | 354 |
| Area (m ₂) | 509 |
| ROI | 6.7% |



- Solar Edge technology
- 100% of energy generated is used on site





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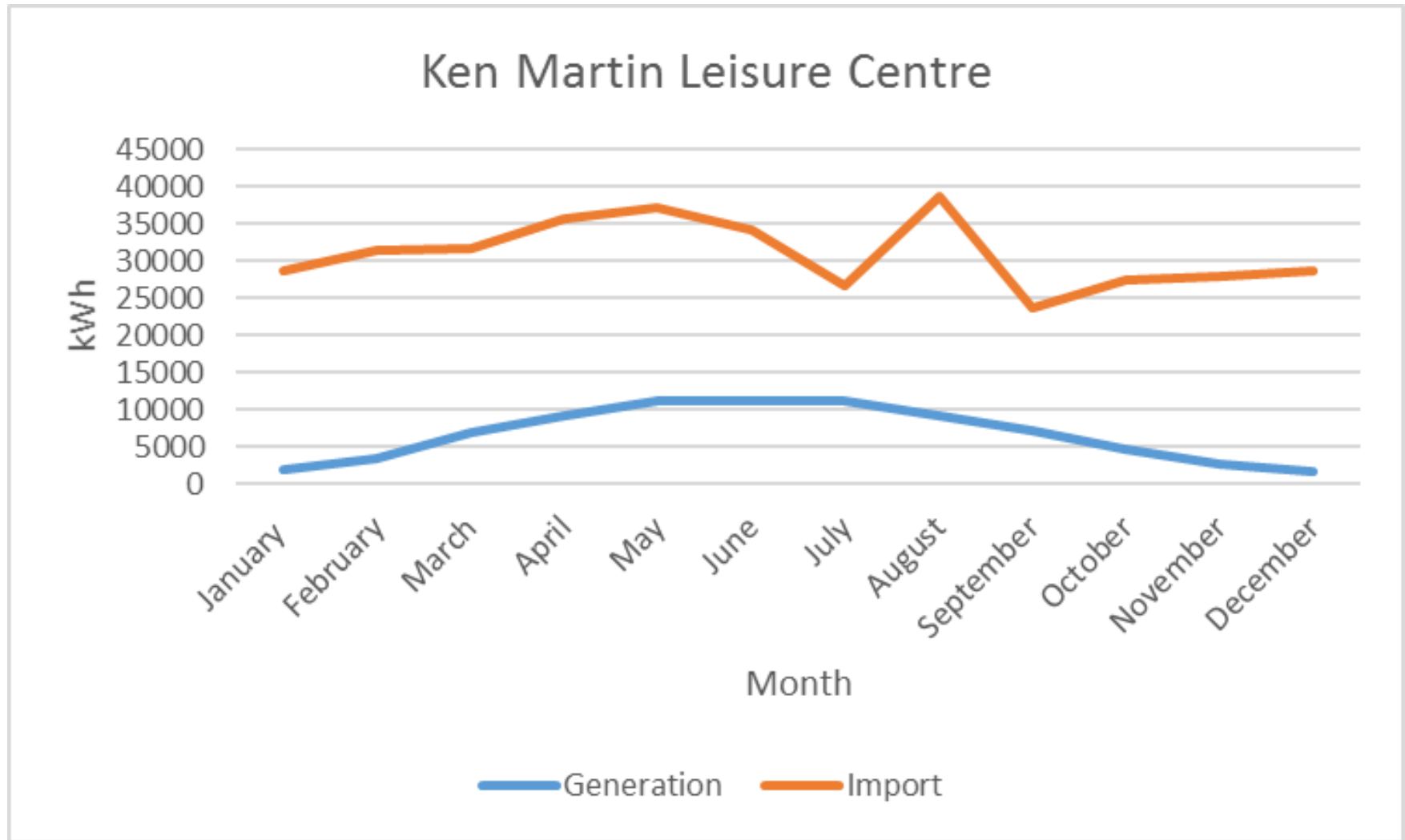
Ken Martin - Battery Storage



- Sonnen Battery
- Modelling grid interaction software
- Grid services (supporting the local electricity grid).
- Surplus energy storage (from the Solar Canopy).
- Load shifting (to avoid high charge periods).
- EV Charging (future).



Generation v Import



Combined Solar PV statistics

| Site | kWp | Number of panels | EAG (kWh) | CO ₂ savings Kg's | Area (m ₂) | ROI |
|------------------------------|-------|------------------|-----------|------------------------------|------------------------|-------------|
| Minver Sports Centre | 49.02 | 172 | 40,966 | 18,783 | 282 | 5.6% |
| Nottingham Tennis Centre | 151 | 600 | 118,832 | 62,000 | 888 | 6.7% |
| Southglade Leisure Centre | 49.28 | 176 | 42,430 | 19,454 | 238 | 7.8% |
| Harvey Hadden Sports Village | 67 | 448 | 50,722 | 28,650 | 575 | 7.1% |
| Ken Martin | 88.5 | 354 | 79,874 | 36,622 | 509 | 6.7% |
| Combined | 404.8 | 1,750 | 331,824 | 165,509 | 2,492 | 6.78% (avg) |



Can Nottingham City Council support your aspirations?

- Only tier 1 modules used ✓
- Quality inverters with high efficiency rating ✓
- SolarEdge technology utilised where needed ✓
- Highly trained and experienced engineers ✓
- Experienced project managers ✓
- Qualified and experienced designers ✓
- Fully accredited internal delivery team ✓
- In house monitoring and maintenance ✓
- Industry leading workmanship warranties ✓
- Numerous industry awards received ✓



Hot Water Optimisation

We've rolled out a hot water optimisation system across all of our leisure centres which reduces secondary circulation by monitoring and predicting when peak demands will be, effectively shutting down during periods of low demand.

- Project cost - £59,110
- Financial savings - £30,043/yr (2.29 year payback); £358,262 lifetime
- Energy savings – 1,202,604 kWh/yr; 8,225,811 kWh lifetime
- Carbon savings – 225 tonnes/yr; 2,801 tonnes lifetime



Pool Covers – Martin Jackaman Leisure Centre

- New pool covers were installed across the 55m² swimming pool.
 - Installing motorised covers ensured heat loss was significantly reduced and was quicker and easier than using manual covers.
-
- Project cost - £6,125
 - Financial savings - £1,228/yr (4.99 year payback); £10,375 lifetime
 - Energy savings – 40,387 kWh/yr; 341.270 kWh lifetime
 - Carbon savings – 7 tonnes/yr; 63 tonnes lifetime



LED Lighting

- Lighting upgrades are taking place in many leisure centres
 - Saving energy and money
 - Improve the aesthetics and ensuring in particular that pool areas are adequately and safely lit without impacting upon the ambience.
 - Recent LED lighting installation took place at Victoria Leisure Centre including pool areas, changing rooms and health suites with different lighting requirements in each.
-
- Project cost - £34,535
 - Financial savings - £9,086/yr (3.8 year payback); £181,711 lifetime
 - Energy savings – 86,529 kWh/yr; 1,730,580 kWh lifetime
 - Carbon savings – 39 tonnes/yr; 778 tonnes lifetime



Considerations & Questions?

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