# **Case Study**

## **Energy Reduction at 2 High Street**

### Background

Property Services energy team monitor the energy use within all Perth and Kinross Council buildings forming part of the overall property estate. As part of this process, Property Services energy team highlight a list of buildings each year which are considered 'high energy users'. The office building at 2 High Street has been included on this list every year up until the completion of the full building refurbishment in October 2016.

#### Refurbishment Works (Jan 2015 to Oct 2016)

The refurbishment project was carried out at 2 High Street to provide office accommodation in a modern, efficient and flexible environment for staff. The principal design aim was to return the building to an open plan layout maximising space utilisation after years of operating as a cellular office environment. The building improvement works, combined with upgrades to both mechanical and electrical systems, has created a new modern and energy efficient office space which embraces flexible working for circa 200 additional staff in the building post refurbishment. In addition an enhanced IT Hub was developed in the building.

#### Approach to Energy Reduction

New mechanical and electrical infrastructure including energy efficient boiler plant and equipment, lighting, intelligent building control systems and roof mounted photovoltaics were installed as part of the overall strategy to reduce energy consumption in 2 High Street.

At the project design stage, Property Services energy team utilised a thermal modelling software package to identify the projected energy usage. This energy modelling software was then used to analyse data from newly installed gas and electric meters and building management systems (BMS). This data highlighted inefficiencies in building performance, ultimately resulting in higher energy use during times of operation. The energy team then reviewed the data and made changes to the building management and lighting controls to reduce energy consumption. These changes included:

- Reduced internal set points on BMS
- Reduced heating time schedules on BMS
- Eliminate over-heating, alterations made on BMS
- Reduce main boiler flow temperature, alterations made on BMS
- Improve boiler efficiency through modulation
- Improve BMS software to maximise efficiency
- Reduce electrical load by alterations to mechanical equipment operation time
- improvements to lighting levels and control operation
- Improved efficiency of air conditioning units
- Installation of photovoltaic panels that generate electricity for air conditioning at no cost for IT Hub during warmer/summer weather.

#### Outcomes

Through close energy monitoring on this project by the Property Services energy team, the energy reduction achieved for 2 High Street since the date the building was re-occupied is substantial.

The table below indicates the reduction in energy consumption for a 12 month period in 2016/17(October 2016 to September 2017) compared to a 12 month period in 2012/13 and 2013/14. Direct comparison for 2014/15 and 2015/16 is not possible as these include the period when the building was closed and main refurbishment works were carried out.

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Year		• • • • • • • •	
(Oct to Sept)	Electricity (kWh)	Gas (kWh)	Total (kWh)
2012/13	737,751	1,253,746	1,991,497
2013/14	640,443	1,137,089	1,777,532
2014/15	N/A	N/A	N/A
2015/16	_N/A	N/A	N/A
2016/17	532,235	784,217	1,316,452



Comparing the energy use in 2 High Street for a 12 month period in 2016/17 against the energy consumption in 2012/13 highlights a reduction in energy of 34% in terms of kWh used. In financial terms this equates to a saving of £32,000.