Llywodraeth Cymru
Welsh Government

WEP Strategic Partnering Framework

Energy Strategy for MIM Projects
Market Engagement Paper

December 2018

INTRODUCTORY NOTE

1. Policy Background

1.1 This paper deals with the energy strategy on MIM Projects in the education sector, delivered through the WEP Strategic Partnering Framework[1]. The approach has been developed to align with Welsh Government policy and the aims and objectives include:

'***a 21st Century Schools Standard for all schools in Wales which reduces recurrent costs, energy consumption and carbon emissions'.***

1.2 Welsh Government's "One Wales: One Planet" region-wide sustainability strategy, the subsequent Well-being of Future Generations (Wales) Act 2015 and Energy Efficiency Strategy all highlighted the importance of reducing energy demand as the first step in addressing the issues of finite resources, energy security and climate change and achieving sustainability. These policies and strategies all noted the important role education and, specifically, the design and management of schools across Wales had to play in achieving the goals set out and underpin the government's approach.

1.3 The 2017 Auditor General Report for 21st Century Schools Band A projects noted many positive outcomes in terms of the number and quality of projects. However, one area for concern was energy consumption:

'some new school buildings have not achieved the intended environmental standards and there is widespread concern that energy efficiency technology has not delivered the expected cost savings.'

1.4 It is therefore Welsh Government's intention to revisit energy strategy on Band B MIM Projects, particularly in light of the fact that data published by the Department for Education (hereafter "**DfE**") shows that energy costs represent a sizeable proportion of a school's annual operating costs.

[1] The approach to D&B projects is not addressed through this paper, but is being developed by Welsh Government using the same aims

ENERGY STRATEGY

1. Engagement

1.1 The market is invited to provide comment upon the high-level proposals for the energy strategy, to be adopted on MIM Projects in the education sector. In particular in relation to the following:

- Energy Targets proposed;
- Sharing of energy data with the Authority and Welsh Government;
- Developing a predicative energy model;
- Energy modelling skills required;
- Approach to seasonal commissioning;
- Automating the collection and analysis of energy data; and
- Payment Mechanism principles, Completion Criteria requirements and Performance Standards, as detailed below.

2. Energy Strategy Objectives

2.1 The aims of the energy strategy are to:

- Propose improvements to the Authority's Construction Requirements to reduce building energy use from current levels.
- Close the current gap between energy modelling developed at design stage and actual energy use measured in the operational building.
- Develop a more detailed energy model at design stage that can be used as a tool to compare against actual energy use and identify where systems are not performing as designed.
- Improve collection and accuracy of data relating to energy use to improve knowledge and lessons learned for this and future programmes.
- Automate part of the energy analysis process to measure performance.
- Improve commissioning to ensure systems work as designed.
- Propose performance measures including energy targets that will incentivise Project Co to improve actual energy use.

3. Background - Research and Findings

3.1 In order to determine appropriate targets for MIM Projects in the education sector, a review of the performance of existing education buildings across the UK was undertaken. Of interest were the schools developed under the Education Skills Funding Agency (hereafter "**ESFA**") Priority Schools Build Programme (hereafter "**PSBP**"), as this programme had a clearly defined specification with an emphasis on reduced energy consumption. Research into how schools were performing included:

- Consulting with representatives of ESFA and iSERV;

- Interviewing a number of contractors to determine how schools are performing in reality;
- Contractors' surveys;
- Site visits made to a number of schools; and
- Secondary research using Carbon Buzz, Innovate UK and industry specialists.

3.2 From this process it became evident that there was little information available in the public domain as to the actual energy performance of the new schools built under the ESFA specification. Many are newly built in their first few years of operation and the energy data is only now starting to become available.

3.3 The findings of the research indicate a wide range of energy consumption across the schools. Whilst there is no robust evidence currently available, the indication is that some schools designed under the 2013 PSBP Facilities Output Specification (hereafter "**2013 ESFA FOS**") are failing to meet the required energy targets, whilst others are readily achieving them. There is no apparent single reason for this, with the suggestion that the failure could be attributed to a number of the following factors: poor design; incomplete commissioning; overly complicated BMS; and lack of training of the end users. Anecdotal evidence suggests that a number of the buildings were overheating.

3.4 As part of the research, we also looked at a small number of PassivHaus schools. For PassivHaus buildings there was a clear and widely understood priority for reducing energy consumption at the operational stage resulting in consistently low levels of energy consumption for the small sample that was reviewed. It was however acknowledged that this design approach can add 5% plus to the capital cost of the building over a standard design.

3.5 A review of the schools designed under 2013 ESFA FOS was undertaken to include both passive and active elements of the building. The key recommendations made to the Welsh Government following this review were:

- Retain focus on achieving good daylighting in buildings;
- Reduce overheating by introducing CIBSE TM 52 requirements in full. The CIBSE 2020 weather files should be the minimum used to test compliance;
- Ensure that a ventilation system with heat recovery is the default design requirement;
- Implement greater review of the energy model in relation to actual energy consumption to calibrate the model and identify where systems are not performing;
- Simplify energy metering and reporting with an automated energy management system that is independent of the school's IT network;
- Enable uploading of building performance data to a centralised platform (such as K2 or iSERV) to enable a comparison between facilities to be made.

3.6 An output of the research and recommendations outlined above was the development of an energy output specification, to be included in the Authority Construction Requirements (hereafter "**ACR**s") for MIM Projects in the education sector, using the 2013 ESFA FOS as a starting point.

4. Proposed Energy Targets

4.1 The starting position for establishing energy targets for the buildings under MIM Projects in the education sector was the adoption of those currently used in the 2013 ESFA FOS (note the concept of removing non-core hour activity was retained).

4.2 In the absence of any data or targets for colleges, benchmarks from The Energy Efficiency Best Practice Guides ECG 54 for Higher Education and ECG 73 for Schools were used as was CIBSE TM46. These were used to calculate the average ratio of energy usage between schools and colleges which was then applied, to the 2013 ESFA FOS targets.

4.3 The proposition that some of the schools are readily achieving the energy targets suggests that the modelling results were largely correct; that the current 2013 ESFA FOS targets are achievable and that lower targets may be appropriate. Furthermore, the evidence is that the PassivHaus schools are consistently delivering lower energy consumption compared to other schools and in terms of heating, half that of the 2013 ESFA FOS targets. This being the case, the adoption of the PassivHaus envelope and systems' performance particularly when reinforced by the overall delivery methodology, suggests that targets in line with the PassivHaus standards could be achieved.

4.4 It was noted that the 2013 ESFA FOS envelope requirements were not significantly different to PassivHaus standards with the exception of the requirement for triple glazing, eliminating thermal bridges and very low levels of infiltration.

4.5 While energy data supported the PassivHaus methodology, it was noted that this standard could result in an increase in the capital cost of schools. An intermediate target was therefore set using the PassivHaus Planning Package tool[2]. The impact on the heating and electrical usage of replacing triple glazing with double glazing and relaxing the infiltration was calculated. This was then used to modify the targets to an intermediate position between PassivHaus and 2013 ESFA FOS targets. These are presented in the following tables.

4.6 The MIM education energy targets proposed are based on core hour energy use and do not include catering, small power, servers and external lighting. In that way Project Co is responsible for the base loading of the building, whilst systems that are predicated by the building users remain the responsibility of the relevant school or college. Reference to core hours in this context means (i) the Core Day Morning and Core Day Afternoon (defined in Schedule 14 of the MIM Education Project Agreement (Payment Mechanism) as being 07:00 to 17:00[3] during the Academic Year (such period not to include more than 195 Core Days per year)[4]) and (ii) the period from 24:00 to 07:00, 365 days in each Contract Year.[5]

4.7 For Primary schools, in reception and nursery classes it is recognised that free flow is required for pupils to the outside area for play and as such this has a negative impact on the energy consumption where doors directly leading outside are being opened continuously. This is the same with primary schools built under the 2013 ESFA FOS targets and is therefore captured in the targets already. This might be improved in part through considering how the heating systems deliver and control the heating to the space or through the design or managing the operation e.g. creating lobbies or other such transition spaces.

[2] PHPP version 9.6a.

[3] or such other 10 hour period as required by the Authority

[4] 195 Core Days is subject to project specific review under the MIM Education Project Agreement.

[5] This provision makes Project Co responsible for the baseload of the building outside of the Core Days.

Table 1: Energy targets derived from a relaxation of PassivHaus design standards and 2013 ESFA FOS improvements

Primary Schools

Design Energy Targets	Heating	Hot Water	Lighting	Fans & Pumps	Cooling	Lifts	Total
Gas Consumption (kWh/m^2)	35.4	9.0					**44**
Electrical Consumption (kVAh/m^2)			11.7	6.3	0.9	1.0	**20**

Secondary Schools

Design Energy Targets	Heating	Hot Water	Lighting	Fans & Pumps	Cooling	Lifts	Total
Gas Consumption (kWh/m^2)	34.5	9.0					**44**
Electrical Consumption (kVAh/m^2)			11.7	6.3	0.9	1.0	**20**

Primary Schools

Design Energy Targets	Heating	Hot Water	Lighting	Fans & Pumps	Cooling	Lifts	Total
Gas Consumption (kWh/m^2)	45.0	13.0					**59**
Electrical Consumption (kVAh/m^2)			30.0	16.0	2.0	3.0	**51**

4.8 The targets set for the Primary Schools, Secondary Schools and Colleges are presented in the Table 1 above and in the following sections. These are maximum targets and Welsh Government would encourage and look favourably on potential partners who would propose lower targets, if they felt these to be achievable.

4.9 The Target Building Load for which Project Co will take responsibility has been calculated as set out in Tables 2 and 3 below, based on core hours. Outside of core hours the costs of fuel remain with the relevant Authority. The Authority shall be responsible for paying all utility bills with its utilities suppliers, therefore they take the tariff risk (save in respect of consumption risk sitting with Project Co and detailed below).

4.10 An Annual Energy Cap has then been proposed, at 20% above the Annual Energy Target (calculated using the Target Building Load, as described below).

4.11 It is proposed that through the Payment Mechanism, any additional cost of fuel resulting from consumption between the Annual Energy Target and the Annual Energy Cap is shared equally by the Authority and Project Co. Any consumption above the Annual Energy Cap would be Project Co's risk entirely, with the additional fuel costs repaid through the Payment Mechanism.

4.12 For budgetary reasons, it is not proposed to have a reciprocal arrangement on targets whereby if Project Co improves on the energy target it receives a share in the saving.

4.13 Following a two-year post-construction commissioning period, the first Annual Energy Target will be calculated in the manner set out in paragraph 7 below. On an annual basis, from the third year onwards, the Monthly Service Payment will be adjusted in each month throughout the Operational Term, to reflect actual energy consumption against the Annual Energy Target in the previous year. The Annual Energy Target will be set at the lower of the average annual consumption for the previous three years and the Target Base Load (further details are set out in paragraph 7 below). An Annual Energy Cap will be set by adding a 20% allowance to the Annual Energy Target. The calculation will be set out in the Payment Mechanism and is presented in high level in Tables 2 and 3 below assuming the Target Building Load is used as the Annual Energy Target. The Target Base Load for colleges (in Table 3) is higher than for schools, as it is based on the arbitrary multiplier derived from the benchmarking data referred to above.

Table 2: MIM Schools Target Base Load, and User Load Benchmarks and Energy Cap

Demise	Energy End-Uses	Benchmark (kW/m^2)	Benchmark (kWe/m^2)	Target Building Load	Allowance	Energy Cap	Payment Mechanism	
Building Load (Project Co)	Heating	35.4	14.2	38.2	20%	**46**	Where the Building Load is greater than the Energy Cap, the difference will be paid by Project Co	Consumption between the Target Building Load and the Energy Cap will be shared 50/50 by Project Co and the Authority/Facility
	Lighting & Emergency Lighting		12.0					
	Emergency Lighting		0.0					
	Swimming Pool		0.0					
	Space Cooling		1.0					
	Fans and Pumps		7.0					
	Building Services (lifts, security, fire)		3.0					
	Lifts		1.0					
Target Building Load			**38.2**					
User Load (Authority / Facility)	DHW	9.0	1.6				All consumption within the User Load will be paid by the Authority or Facility	
	Server Rooms		4-8					
	Equipment		5-10					
	External Lighting		2-12					
	Catering		6-12					

Table 3: MIM Colleges Target Base Load, User Load Benchmarks and Energy Cap

Demise	Energy End-Uses	Benchmark (kW/m^2)	Benchmark (kWe/m^2)	Target Building Load	Allowance	Energy Cap	Payment Mechanism	
Building Load (Project Co)	Heating	35.4	18.1	70.1	20%	**85**	Where the Building Load is greater than the Energy Cao, the difference will be paid by Project Co	Consumption between the Target Building Load and the Energy Cap will be shared 50/50 by Project Co and the Authority/Facility
	Lighting & Emergency Lighting		30.0					
	Emergency Lighting		0.0					
	Swimming Pool		0.0					
	Space Cooling		2.0					
	Fans and Pumps		16.0					
	Building Services (lifts, security, fire)		3.0					
	Lifts		1.0					
Target Building Load			**70.1**					
User Load (Authority / Facility)	DHW	9.0	1.6				All consumption within the User Load will be paid by the Authority or Facility	
	Server Rooms		4-8					
	Equipment		5-10					
	External Lighting		2-12					
	Catering		6-12					

5. Energy Strategy Implementation/Commissioning

5.1 Welsh Government does not require any energy modelling to be undertaken in the procurement of the PSDP/WEPCo, however the following sections relating to how energy modelling will be used as part of the commissioning process on Approved Projects, needs to be borne in mind.

5.2 There is anecdotal feedback from PSBP that commissioning of equipment and systems is not being completed satisfactorily which results in poor system performance and in turn incurs an energy penalty. To address this on education sector MIM Projects, Welsh Government are proposing the introduction of an Independent Commissioning Agent who will ensure that the systems are correctly commissioned prior to the Payment Commencement Date.

5.3 The ACRs in the Template MIM Education Project Agreement will require an Energy Model, similar to the approach in PSBP, to be created at the design stage and developed and refined to an "in use" model, following the Actual Completion Date. It is proposed that there will be a post completion commissioning period where energy and environmental performance is monitored on a weekly/monthly basis. The main difference with the approach adopted under PSBP is that these energy models will have to be accurate, to reflect the control strategies and set points. This will require a higher level of simulation modelling skills than typically was required under PSPB. WEP Co will be required to demonstrate

during the tender stage that they can procure and deploy these skills effectively when pulling together a team for the programme delivery.

5.4 Immediately prior to the Actual Completion Date, Project Co will update the Energy Model to reflect the as-built design. This will include all mechanical & electrical plant, ICT equipment, catering equipment, equipment for educational purposes, and all associated controls set up to accurately reflect the control set points and strategy.

5.5 Following the Actual Completion Date, Project Co will commence collecting the energy data for all the systems in the building and compare these to the predicted data from the Energy Model. The primary objective of this activity is to ensure that all the meters and sub-meters are correctly collecting the energy/environmental data and allow remediation measures to be taken where meters are failing to record the data. The data will then be used to assess whether systems are operating correctly as designed, and any actions needed to correct faults. It should also identify where systems are fighting against each other. This data should be reviewed on a weekly basis until it is determined that the systems are operating correctly.

5.6 Six months following Actual Completion Date and again at twelve months, Project Co will review in detail the available energy and environmental data and profiles and compare this with the data from the Energy/Thermal Model for the respective period. This should take into account anything that might be different between the data sets, such as weather data, occupant behaviour or equipment usage. Where discrepancies are noted between the two, the possible causes must be identified and where required, remedial action taken (limited to the obligations that sit with Project Co under the PA). Remedial works will be carried out by Project Co using the 'standard' procedure for rectifying defects such that the impact on the Facility will be minimised and works carried out outside of operating hours i.e. evenings, weekends and outside of the term time. The obligation for remedial works will commence from the Payment Commencement Date.

5.7 At the end of the first twelve month post occupancy period, the building should be operating correctly, with the reliable collection of the energy and environmental data. For the following twelve months, on a monthly basis, Project Co will be required to monitor the energy data and compare it with the predicted data from the energy model. This exercise should consider any differences between the two data sets, such as weather, occupancy etc. If significant discrepancies are identified, the weekly energy environmental data profiles should be compared with those of the energy/thermal model, to identify which systems are different and the causes for this. Both the Energy Model and the actual building systems should then be optimised to align the two sets of data. While the upper limits for the MIM education sector energy targets are identified in Table 3, if the actual energy consumption is demonstrated to be lower than the proposed MIM targets, then the Payment Mechanism target will also be lowered to reflect this.

5.8 If at the end of the two-year period there is still a significant discrepancy between the two sets of data, Project Co will provide a report identifying what the discrepancies are, why they are occurring and what measures should be taken to rectify the difference. Failure to achieve the targets following the two year commissioning period will result in the Monthly Service Payments being reduced, as described in paragraph 4 above. No re-deduction to the Monthly Service Payment shall be made during the two-year seasonal commissioning period; instead Project Co will be obliged to rectify any faults such that energy use is consistent with the Energy Model.

5.9 Table 4 below sets out the proposed energy strategy implementation process outlined above, for the first two years of the buildings operation.

Table 4: Energy Strategy Seasonal Commissioning and Bedding-In Timeline

	Commissioning Period	MONTH																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Update Energy Model to accurately reflect as built information																									
Check data is correctly being recorded and fix meters if required																									
Check data indicates each system is performing correctly																									
Compare metered energy with model for typical weekdays and weekends																									
Rectify any system which is not performing correctly																									
Compare metered energy 6-month consumption data with energy for the equivalent period																									
Monitor and fine tune systems																									
Compare metered energy 12-month consumption data with energy for the equivalent period																									

6. How will the Energy Strategy be addressed in procurement of the PSDP/WEPCo and the New Project Approval Process?

6.1 Reducing energy consumption is one of the key aims of delivering MIM Projects under the WEP Strategic Partnering Framework. The terms will be mandated though the Template MIM Education Project Agreement and bidders in the procurement of the PSDP/WEPCo will therefore be expected to confirm commitment to build a supply chain that can address and deliver the approach described. Specifically, as identified in Table 5 below, that they can:

- Develop a supply chain with sufficient skills to undertake the modelling required.
- Develop a supply chain that can deliver the required energy savings through the design and construction of low energy buildings.
- Develop processes and methodologies for the ongoing recording and analysis of energy use on New Projects, during the Operational Term.

6.2 The Energy Strategy requirements will be incorporated into the Template MIM Education Project Agreement (in particular within the technical schedules). As noted above, sums due by Project Co for failure to achieve the Annual Energy Target will be applied through the Payment Mechanism, to offset the additional energy cost to the Authority above the Annual Energy Target. The proposed methodology for payments is outlined in more detail below.

6.3 Under the Template MIM Education Project Agreement, Project Co will be required to develop a Thermal Model and Energy Model for both stage 1 and stage 2 submissions, with detailed models being required at stage 2. These must achieve the energy targets outlined above and will be used as a baseline for the Completion Criteria at handover.

6.4 Project Co will also be required to provide regular energy performance reports, using the Energy Management System, and identify and correct any increases in energy usage where applicable.

6.5 At SPA level, the WEPCo will be measured against the Energy Strategy Key Performance Indicators (KPIs). KPIs will be reviewed at the Annual Review meeting between Participants and WEPCo, with the KPIs being reviewed having regard in particular to the principle of continuous improvement.

Table 5: Roles and Responsibilities

Roles and Responsibilities	Stage
Demonstrate in Procurement of Strategic Partner	
Selecting a supply chain that can respond to the design requirements and undertake the required level of modelling at Stage 1 and Stage 2.	**WEP Co responsibility when procuring Project Co**
Methodology as to how they go about this: • Ability to demonstrate experience in developing predictive energy models • Demonstrate where they have experience of comparing predictive models with actual usage	
Methodology and experience in setting up energy monitoring systems.	
WEP Co Energy Responsibilities	
Select Project Co design team with the following expertise: • Track record in delivering low energy design	**WEP Co responsibility**

• Ability to develop robust energy models during design development • Demonstrate where they have experience of comparing predictive models with actual usage • Develop effective and accurate energy/environmental monitoring system	**when procuring Project Co**
Ensure Project Co develop designs that meet energy targets	
Develop energy monitoring system that can be used across the Project Co's for energy monitoring assessment. • Develop system that allows for direct upload of energy data • Develop system with K2N (or other platform) that undertakes automatic monitoring of actual energy use against the design energy model • Enter into data collection platform contract e.g. K2N	
Ensure Project Co are reporting energy use in operation to data platform	
Ensure Project Co are actioning systems to address discrepancies between design model and actual where significant differences exist	
Compare Facility performance across the programme and identify where buildings are under performing	
Undertake reviews of Project Co performance and ensure supply chain are delivering energy targets and addressing performance issues	
Project Co Energy Responsibilities	
Develop project design that achieves the following: • Complies with the requirements of the ACR's • Includes a BMS and EMS • Compliance with BREEAM requirements should run from compliance with ACR's • Generate an accurate and detailed energy model that complies or betters the target utilities requirements	**Project Co responsibility under the Template MIM Education Project Agreement**
Build the building	
Commission the building: • Ensure the meters are working and calibrated • Respond to independent commissioning comments • Ensure energy is being reported to K2N or equivalent • Calibrate model to compare the actuals against the original model and undertake works as required in the commissioning table • Undertake works required to close identified gaps between the model and actuals • Agree final calibrated model with relevant Authority	
Maintain the building: • Continue to report • Continue to monitor • Undertake corrective actions and maintenance/replacement as identified	

7. How will the delivery of the Energy Strategy be delivered?

Payment Mechanism

7.1 The following principles will be applied to the provisions of the Payment Mechanism in the Template MIM Education Project Agreement:

7.2 Utilities payments will be made by the Authority (as between the Authority and Project Co).

7.3 Whilst all utilities will be measured Project Co will only be responsible for managing the base load utilities consumption defined as including:

- space heating - energy used in maintaining building temperatures;
- internal lighting and emergency lighting excluding security lighting;
- building related services - including protection systems, fire alarms, sprinkler systems and intruder alarms, lifts, major ventilation plant including that serving changing rooms, toilets and kitchen, boiler plant and pumps and other plant and any air conditioning loads, i.e. to server room or teaching areas.

7.4 The Authority will retain responsibility for small power; direct hot water; external lighting; and catering.

7.5 Each year, on and from the date falling 2 years after the Actual Completion Date, Project Co will propose the Annual Energy Target for the forthcoming year, which shall be the lower of the average consumption for the previous three years and the Target Building Load.

7.6 In the early years where three years of data is not available the following shall be used:

- Year 3: using Year 2 consumption
- Year 4: using the average of Year 2 and Year 3 consumption

7.7 As outlined above, adjustments to the Monthly Service Payment will only commence following the two-year seasonal commissioning period, during which Project Co will be responsible for rectifying any faults identified.

7.8 On an annual basis, from the third anniversary of the Actual Completion Date, the Monthly Service Payment will be adjusted in each month throughout the Operational Term, to reflect actual energy consumption against the Annual Energy Target in the previous year. Actual consumption for the year will be recorded and compared with the Annual Energy Target at the end of the year. An Annual Energy Cap will be calculated at 20% above the Annual Energy Target.

7.9 To the extent that actual consumption exceeds the Annual Energy Target, between the Annual Energy Target and the Annual Energy Cap, Project Co shall be liable for an amount equal to 50% of the additional utilities used. Above the Annual Energy Cap, Project Co shall be liable for an amount equal to 100% of the additional utilities used.

7.10 To the extent that actual consumption is lower than the Annual Energy Target, no deductions will be applied against Project Co and no savings paid to Project Co.

7.11 The difference between the actual energy consumption and the Annual Energy Target/Annual Energy Cap in any year, shall be divided by 12 and applied to the Monthly Service Payments in the following year. Amounts due by Project Co shall therefore be applied in arrears spread equally over the monthly payments. Where payments are due from Project Co, these will be calculated using the tariffs paid by the Authority during that year. In the final year it is proposed that any sums due by Project Co would, in the first instance, be deducted from the Retention Fund referred to in Schedule 18 of Template MIM Education Project Agreement.

7.12 Project Co may seek to introduce further Energy Saving Technology.

Completion Criteria

7.13 The Completion Criteria will include the following:

7.14 The provision of a Thermal Model and Energy Model as required by the Authority's Construction Requirements;

7.15 The building management system and automated energy management system is:

- complete, tested, commissioned and operational including the setting up of graphs, logs or equivalent; and
- automated weekly and monthly reports are being generated and uploaded to the k2N portal, or equivalent;

7.16 The Soft Services Training Plan will include initial End User training in relation to the building and energy management systems

Performance Standards

7.17 The following Performance Standards are being considered for inclusion in Schedule 12 of the Template MIM Education Project Agreement (Service Level Specification). This is not an exhaustive list of energy related Performance Standards.

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
	Energy And Utilities								
PSxx	Energy Reporting	Ensure that energy data is being uploaded to the K2N site	High	None	None	Each month	3, 5, 6	Failure to upload the required energy data within 5 Business Days of the end of each Contract Month	[xx] Business Days To commence from the date 5 Business Days from the end of the Contract Month Remedy: Upload of the monthly energy data
PSxx	Energy Reporting	Monitor and report on Energy and Utilities consumption as required by paragraphs 2.3, 2.7	High	None	None	Monthly	2, 3, 5, 6	Failure to provide the monitoring and reporting of energy and water consumption to the	[xx] Business Days To commence from the date 5

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
		and 2.8, including comparison of actual consumption of energy use against energy model						Authority Representative including monthly and quarterly reports within 5 Business Days of the end of the Contract Month	Business Days from the end of the Contract Month Remedy: Issuance of the energy reports in the required form
PSxx	Energy Reporting	Undertake detailed analysis of actual consumption of energy use against energy model to assess how each of the systems is performing and identifying cause where there is a significant difference	High	None	None	To be reviewed annually if consumption below Target Base Load, otherwise monthly	3, 5, 6	Failure to undertake the required analysis within 20 Business Days of the end of each Contract Month or the end of the reporting year	[xx] Business Days To commence from the date 5 Business Days from the end of the Contract Month or reporting year Remedy: Issuance of the required analysis

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
PSxx	Energy and Utilities Management Plan (including efficiency)	Updating the Energy and Utilities Management Plan as required under paragraphs 1.9.10, 1.9.11 and 1.9.12.	High	None	None	Daily per Plan	2, 5, 6	Failure to provide the updated Energy and Utilities Management Plan within 3 Business Days of the due date	[xx] Business Days To commence from the date 3 Business Days from the due date Remedy: Issuance of the updated Energy and Utilities Management Plan Lifecycle Schedule or written confirmation of the existing Plan
PSxx	Operating Efficiently	Operating the Building to minimise Energy and Utilities consumption in accordance with	Medium	None	None	Daily per Facility	2, 5, 6	Failure to demonstrate that operational inefficiencies identified in the	

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
		paragraph 2.7.12.						Energy and Water Efficiency Plan have been rectified	
PSxx	Energy Efficiency Assistance	Project Co shall provide assistance to the [Authority/School Entities] to improve energy efficiency including participation in [Authority/School Entity] energy forums and providing input into [Authority/School Entity] decisions relating to energy consumption	Medium	None	None	Per request	5, 6	Each failure to attend energy forums and/or provide assistance to the [Authority/School Entity] within 5 Business Days of a request from the Authority Representative	None
PSxx	Utilities Interruptions	Project Co shall obtain written consent from the Authority's Representative prior to arranging/agreeing to interruptions in the	Medium	None	None	Per event	1, 5	Each incidence of allowing Utilities interruptions without receiving prior consent from	None

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
		supply of utilities to the Facility.						the Authority	
PSxx	Building Controls and Energy Management Systems	Manage Building Controls and Energy Management System in accordance with paragraph [1]	Medium	None	None	Daily per Facility	2, 5, 6.	Failure to provide meeting minutes of month one and month nine site walkabout, recording attendees, and agreeing any changes to systems and/or behaviour patterns.	None
PSxx	Building Controls and Energy Management Systems	Manage Building Controls and Energy Management System in accordance with paragraph [2.3.32.2].	Medium	None	None	Every six months	2, 5, 6.	Failure to provide evidence of testing of Building Controls, metering and monitoring and EMS to check setting are correct.	[20] business days

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
PSxx	Utilities Invoice Verification	On receipt of utilities invoices from the Authority, Project Co shall verify the consumption data against meter readings and confirm their accuracy.	Low	None	None	Daily per Invoice	2, 5, 6	Failure to take meter readings or verify utilities invoices against meter readings and confirm their accuracy to the Authority Representative within 5 Business Days of receipt of Utilities invoices.	None
PSxx	Display Energy Certificate	To supply DEC for each Facility in accordance with paragraph [2.7.12.4.8].	Low	None	None	Daily per DEC	5, 6	Each failure to produce a Display Energy Certificate or keep it up to date	[xx] Business Days To commence from the date a valid request to produce a DEC is made by the Authority Remedy:

	Performance Standard	Performance Requirement	Service Priority Category	Response Period	Rectification Period	Monitoring Frequency	Monitoring Method (s)	Definition of Failure	Remedial Period / Remedy
									Production of a current and valid DEC in the required form
PSxx	Water run-off and sewage	To remove sewage and run-off water from each Site in accordance with paragraph 1.13.4.1.	High	None	None	Per Event		Failure to ensure removal of effluent and hazardous waste	None

Key Performance Indicators

7.18 The following Key Performance Indicators are proposed (these are described in a high-level manner for the purposes of engagement):

Key area of performance to be reviewed	**KPI**	**KPI Measurement**	**How measured**	**Target**
Energy	All energy consumption data to be uploaded to K2N is up to date and current	Data up to date for all MIM Projects throughout the Operational Term	*How measured:* Report confirming data uploaded for each MIM Project, as reported by Project Service Providers on MIM Projects to WEPCo. *By Whom:* WEPCo *Frequency:* Quarterly review, per Project	All data loaded
	The percentage of compliance with Annual Energy Targets by Project Service Providers on MIM Projects	100% of MIM Projects to be performing below the Annual Energy Target	*How measured:* Actual energy use compared with Annual Energy Target, as reported by Project Service Providers on MIM Projects to WEPCo,	Actual energy use to be below the Target Building Load

			By Whom: WEPCo *Frequency*: Quarterly review, per Project, with projects being measured on and from second anniversary of Actual Completion Date	

8. Do you have any energy data you can share with us?

8.1 We are in the process of collating further energy benchmark data from schools and colleges, particularly those completed under the ESFA's PSPB programme. As part of this engagement exercise, we would welcome any further energy data you may have for recently completed educational facilities.

Appendix 1

Glossary

"Academic Year"	has the meaning given in the Template MIM Education Project Agreement.
"Actual Completion Date"	has the meaning given in the Template MIM Education Project Agreement.
"Annual Energy Cap"	means the Annual Energy Target, plus 20%.
"Annual Energy Target"	means the lower of, the average consumption for the three previous years and the Target Building Load (described in further detail in paragraphs 7.5 and 7.6 of this Engagement Paper).
"Annual Review"	has the meaning given in the SPA.
"Approved Project"	has the meaning given in the SPA.
"Authority"	means the relevant Participant party to a Project Agreement for a New Project.
"Authority's Construction Requirements" or "ACRs"	has the meaning given in the Template MIM Education Project Agreement.
"BMS"	means Building Management System.
"CIBSE"	means Chartered Institute of Building Service Engineers.
"CIBSE TM52"	means the best practice guidance produced by CIBSE on 'The Limits of Thermal Comfort'. https://www.cibse.org/Knowledge/knowledge-items/detail?id=a0q20000008I7f5AAC
"Completion Criteria"	has the meaning given in the Template MIM Education Project Agreement.
"Contract Year"	has the meaning given to that term in the Template MIM Education Project Agreement.
"Core Day"	has the meaning given in the Template MIM Education Project Agreement.

"Department for Education" or "DfE"	has the meaning given in paragraph 1.4 of this Engagement Paper.
"D&B Projects"	has the meaning given to it in the SPA.
"Education Skills Funding Agency" or "ESFA"	has the meaning given in paragraph 3.1 of this Engagement Paper.
"EMS"	means Energy Management System.
"Energy Efficiency Strategy"	means the Energy Efficiency Strategy produced by Welsh Government; https://gov.wales/topics/environmentcountryside/energy/efficiency/energy-efficiency-strategy-for-wales/?lang=en
"Energy Model"	means a three-dimensional computer-generated representation of the educational building, that accurately represents the fabric, systems, controls and usage of the building, such that it can accurately predict the future energy consumption of the building.
"Energy Saving Technology"	means technology that be used to reduce energy consumption on site or generate energy on site from renewable sources, as part of the initial build, or through provision of flexibility for future installation.
"Independent Commissioning Agent"	means a suitably qualified individual appointed directly by Project Co acting independently, responsible for monitoring and programming pre-commissioning, commissioning, testing and, where necessary, re-commissioning activities. The individual must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from the early design phase for at least 10 months of occupancy.
"One Wales: One Planet"	means Welsh Government's sustainability scheme. https://gov.wales/docs/desh/publications/090521susdev1wales1planeten.pdf
"PassivHaus"	PassivHaus is a German energy efficiency standard for buildings, focusing on the reduction of heat loss through the buildings fabric.

“PassivHaus Planning Package Tool”	Means version PHPP 9.6a – a planning tool used to develop an energy efficient design solution. http://www.passivhaustrust.org.uk/design_support.php
“Performance Standards”	Are the key performance standards for the Services as set out in the Service Level Specification at Appendix A.
"PSBP"	has the meaning given in paragraph 3.1 of this Engagement Paper.
“Target Building Load”	means the limiting amount of energy consumption per year associated with systems for which Project Co is responsible.
"Template MIM Project Agreement"	means the form of agreement set out in Section 1 of Schedule 7 of the SPA for use on design, build, finance and maintenance projects, under MIM.
“Thermal Model”	means a three-dimensional computer-generated representation of the educational building, that accurately represents the fabric, ventilation / cooling systems, controls and usage of the building, such that it can determine compliance with the thermal comfort criteria.
"WEP Strategic Partnering Framework"	means the strategic partnering model involving the procurement of the long-term PSDP for the delivery of improved education and community facilities in Wales.
"WEPCo"	means the entity that is party to the Strategic Partnering Agreement charged with delivering the partnering services to the Participant under that Agreement.
"2013 ESFA FOS"	has the meaning given in paragraph 3.3 of this Engagement Paper.

Delivery Structure