# Aldi Developments

## Sustainability Statement

September 2014

# 1 Introduction

1.1 This report provides information to support the application for planning approval at Baileyfield / Portobello High Street in Edinburgh.

1.2 This assessment provides an evaluation of the likely rating that the Aldi phase of the development would achieve under a formal assessment. In turn, this enables the development to be benchmarked against current best practices in sustainability and ensure that the development meets the requirements set out within the Councils supplementary guidance on carbon reduction.

1.3 This report will also outline the sustainable measures that Aldi employ in the operation of the store and demonstrate how the efficiencies of the retailer reduce the overall environmental impact of their operation.

1.4 Appendix 1 of this report provides calculations detailing $CO_2$ emissions based on $CO_2/kgm^2$. The information is shown through SBEM calculations using Scottish Building Regulations as a bench mark on which to improve from. TER (Target Emission Rate) and BER (actual Building Emission Rate) clearly highlight the carbon dioxide emissions based on kilograms per metre squared for the building. Details of the HVAC performance are given within the appendix and their effects on how the benchmark has been improved on.

This report includes the following: -

- A review of the policy documents that provide context to the statement.
- An identification of the general sustainability themes.
- An overview of the sustainability measures that would be built into the development proposals.
- A table summarising the proposed sustainability measures.
- An assessment of Energy Use of the Building against re-usable energy within the development.

# 2 Aldi's Sustainability Philosophy

2.1 Aldi are committed to achieving sustainable development as part of its operations. As a group, Aldi operates an Environmental Management Policy, which has been endorsed by senior management. The objectives for achieving sustainable development as part of their operations ranges both between the day-to-day running of their retail stores, to designing sustainability initiatives within their new buildings. This statement addresses Aldi's sustainability proposals that will be built into their new developments.

2.2 Aldi's philosophy for sustainability builds upon national objectives for achieving sustainable development. This energy statement has therefore been prepared with reference to the following documents:

- Scottish Planning Policy 2014
- Sustainable Edinburgh 2020
- Edinburgh City Local Plan 2013

  Note: This requires the store to make a carbon dioxide reduction of 60% above 2007 Building Regulations targets.

2.3 This strategy presents a generic approach to meeting the targets and objectives for sustainable development. The strategy is based on a number of key themes that are relevant to Aldi's proposals. The themes listed below form the context of this statement.

## Sustainability Themes

- **Minimise Energy Use**: the objective is to minimise energy needs in development by following a hierarchical approach to minimising energy use.
- **Sustainable Building Materials**: this theme covers a range of sustainability impacts including, minimising the energy required for producing and transporting building materials, using recycled material from local sources as far as possible and by choosing materials with a low embodied energy.
- **Sustainable Construction:** This theme covers the methods used during the construction phase to reduce disturbance and the impacts on the surrounding environment.
- **Sustainable Transport and Accessibility**: the objective is to minimise car usage and to encourage walking, cycling and the use of public transport.
- **Waste Management**: the amount of waste generated in the construction process is to be minimised following the national waste strategy: reduce, reuse, and recycle.
- **Site Management**: the objective is to ensure that the site is managed effectively to ensure that sustainability measures are implemented effectively.

2.4 The sustainability measures that are proposed as part of Aldi's development proposals have been developed in accordance with these themes. These measures are presented in detail in **Section 3 – Proposed Sustainability Measures**

# 3 Proposed Sustainability Measures

## Introduction

3.1 Any Aldi development ensures that the issue of sustainability forms a central part of the design process of the scheme, and makes commitments to meet and exceed standards of best practice by encouraging the use of techniques that will enhance the development during both the construction and operational phases

3.2 A number of measures have been incorporated into the scheme to address issues of sustainability. These measures are presented under the broad sustainability themes identified within paragraph 2.3.

## Minimise Energy Use

3.3 The development will incorporate a range of energy saving and efficiency measures in order to minimise the energy demand, and reduce $CO_2$ levels arising from the development. Aldi's approach to minimising energy use within its buildings reflects an energy saving hierarchy, similar to current best practice within the UK.

## Step 1 – Improving the Building Envelope

## Building Fabric Performance

3.4 A buildings ability to retain heat is governed by the choice of construction materials as well as structural design. The envelope of the building will incorporate building elements with U-Values that as a minimum meet standards set out in the current Building Regulations.

## Air Permeability

3.5 The air permeability rate (APR) can also affect a buildings ability to retain heat, with lower permeability yielding greater energy efficiency during operation. During winter months, heat can be lost through air spaces in the buildings construction. The minimum standard for air permissibility as set out in the ADL (2006) is 10$m^3$ of air /hour/per $m^2$ @50Pa. The design of the development would ensure that this standard is met.

3.6 For the retail units, consideration is also given to the loss of heat from openings and loading areas in delivery areas. Heat loss would be minimised by specifying seals on external access doors to limit the ingress of cold air. Service bays will include seals between the building the delivery vehicle to reduce heat loss when delivering goods from HGVs. In the Retail Area, automatic sliding doors would be included at entry points to ensure that when customers are not entering the building, the building is sealed thereby reducing excess heat loss.

## Step 2 – Reducing Energy Demand

## Ventilation

3.7 The development of the buildings would look to make best use of natural ventilation in order to reduce the usage of energy associated with mechanical ventilation systems.

<u>Ventilating the retail area</u>

3.8 Due to the depth of the retail area, the effectiveness of natural ventilation is limited. The use of mechanical ventilation would be put forward to meet the fresh air rates for the development. Ventilation to the office office/staff area is achieved via natural ventilation with openable window in the staff room. The manager office and toilet areas would be mechanically ventilated to satisfy security concerns and building regulations.

## Heating and Hot Water

3.9 In general terms, the requirement for space heating and hot water represents a large proportion of the energy demand for any development.

Supplying heat and hot water to the Retail Unit

3.10 Energy efficiency has also been a key consideration in supplying heating and hot water to the Retail Area. It is recognised that the operation of the Retail Area (Customer Area) will have very low hot water demands however due to the larger floor areas, the space heating requirements form the largest demand on energy.

3.11 With the above in mind, the heating to the Retail area will be via re-usable energy as illustrated in Step 3 (3.19 – 3.24)

## Lighting

Lighting within the Retail areas

3.12 The use of large windows to the front of the retail unit is a common design feature of Aldi stores. The inclusion of these windows helps to provide natural light to the sales floor, and will improve the shops atmosphere and quality of working environment for retail staff, with the location of the tills on this elevation specifically to cater for this. The use of natural light will also reduce the energy demand required for lighting within this area. The extent to which daylight can penetrate the sales floor is dependent on the specifics of each development proposal, and will be influenced by the orientation of the windows, the layout of the sales floor and shading from neighbouring buildings and landscaping. Where possible, the development will look to achieve a 2 % daylighting factor across 35 % of the sales floor. High level glazing is also incorporated into the design along the length of the building where the Retail Space backs on to an external wall. As with the large shopfront, this also improves the ambience of the area with the use of natural light which again will reduce the energy demand for lighting in this area.

3.13 Lighting in the supermarket will usually consist of recessed PL light fittings. These lights will incorporate the use of high frequency ballasts, to maximise the efficiency and operational life of the bulbs. Lighting within the storage areas would also consist of energy efficient lighting.

3.14 Outside trading hours, when the store is closed to the public, lighting levels would be maintained at one-third of the usual levels when stocking shelves. When the store is completely unoccupied, all lights (external and internal) would be switched off. In the event that lights are not turned off, a backup power saving system will ensures that all lighting, including car-parking lighting is turned off 30 minutes after the store is locked.

Lighting external areas

3.15 Lighting will also be supplied to the car parking areas to ensure the security and safety of the sites users. This lighting will be designed in accordance with the CIBSE Lighting Guide 6 – *The Outdoor Environment.* The lighting will be of controlled by timer and photocell, to ensure that the lighting is not used during daylight hours, when not required. All external lighting is switched off by timer, one hour after the store has closed to minimise energy use.

## Cold Food Storage

3.16 Chiller cabinets in the retail store have the potential to use a large proportion of the energy requirement for the development. When choosing the fittings, consideration is given to their demand for energy. Various specifications are proposed to reduce unnecessary energy use. These include the use of sliding doors on chest freezers, and night blinds to improve the energy efficiency of the chiller cabinets when not in use.

3.17 The Aldi Unit also incorporates a 'walk-in' type freezer in the warehouse for the storage of frozen food. As the store will be designed to the appropriate specification in order to reduce energy demand, the cold store evaporators would be designed run at two speeds to achieve the required temperature in their surroundings, whilst a dedicated control panel would monitor the internal temperature to ensure that the cold store only uses the necessary amounts of energy required.

## Building Management System

3.18 All Aldi development are designed with a full Building Management System provided by Evolve Energy Ltd. This will monitor the conditions within the building and will adjust temperatures and start and stop times for plant. It will also monitor heat loss elements such as freezer doors and loading bay doors and if they are left open for excessive times, a report is generated that can then be resolved. This is all controlled from a remote station that can deal with issues and if necessary call out engineers as required. The overall effect is to reduce the energy demand for the building by controlling elements and recording when excessive heat is lost through human failure.

## Step 3 – Re-Usable Energy

3.19 In order to minimise energy demand for the Retail Unit, Aldi Stores Limited seek to re-use and re-cycle any waste energy where possible. The greatest area to recover energy on the retail unit is the 'Waste Heat' generated by the refrigeration system and Aldi Stores Limited recover this heat and use it to heat the building.

3.20 Aldi Stores use a system to recover waste heat from the food refrigerator circuits which would otherwise be discharged into the atmosphere. The heat from the refrigerator would previously have been rejected when the refrigerant hot gasses are cooled in the condensers by external air. Previously a gas heating system was used to make up any shortfall in heating demand.

3.21 With the input and detailed design of a refrigeration engineer and a mechanical services engineer, Aldi now harness the waste heat via an "Arctic Circle" heat recovery system that uses a series of ducts and fans and re-introduces the heat into the building to give 100% of the total building heating demand. The 'Arctic Circle' system has totally removed the need for an independent gas heating system.

3.22 To demonstrate the effectiveness of this system, Aldi have used a typical model in Leicester which, being in the Midlands, represents the average for the whole of the UK. The typical energy demand for an Aldi Development in the Midlands is 271,624 kwh per year.

3.23 The total energy demand for heating to an Aldi Store is 115,416 kwh. The refrigeration installation would generate 150,000 kwh which is more than sufficient to heat all of the retail unit.

3.24 With all the energy demand required to heat the building, being recovered from re-usable energy, 115,416 kwh of the total energy demand for the building of 271,624 kwh is generated from re-usable energy. This represents over 40% of the energy demand for the development being created by re-usable energy.

3.25 Solar panels are proposed to the roof of all Aldi stores where reasonably practical. The proposed array will generate up to 50 kilowatts of electricity in an east-west orientation. Where feasible, and subject to any local restrictions, any excess electricity can be fed back in to the National Grid.

## Sustainable Building Materials

3.25 The materials theme covers a range of sustainability objectives, including minimising the energy required for producing and transporting building materials, using recycled material from local sources as far as possible and by choosing materials with low embodied energy.

## Material Specification

3.26 The use of materials for the development of Aldi's stores will vary from site to site. Notwithstanding this, Aldi is committed to using materials that perform well with regard to the environment, either through their composition and manufacture, and/or through their performance during the commissioning life of the development. Aldi aim to include materials, which are rated highly within *The Green Guide to Specification (Anderson et al. 2004)* and the revised 2007 version. Where possible the external walls, roof, floors, internal walls and the frame will be constructed from materials, which demonstrate a high rating within this guide.

## Timber

3.27 The use of timber in the development will also reflect good sustainable practice. Any timber used in the development will be derived from a sustainable source, including FSC and PEFC sources. Temporary timber, used during the construction process will be reused where possible.

## Reuse of Materials

3.28 In the UK, approximately 275 million tonnes of aggregates are used each year as raw construction materials. This figure is set to grow as the construction industry expands. Scope exists to limit the requirement for new aggregates by using materials recovered from the site or a nearby source.

3.29 The design of the development includes proposals to reuse materials that are derived from the demolition of the previous buildings on site. During the detailed design stage the potential for reclaiming aggregates for the use in the developments footings would be assessed.

## Reusing concrete and masonry

3.30 During construction efforts are made to reuse many of the aggregates derived from the demolition of any former buildings. The opportunities for doing this are dependent on the presence of buildings on the site and the availability of space for crushing recovered materials. As part of the design, aggregates are recovered for high-grade purposes, including for use within pedestrian and car parking area.

## Procuring Materials

3.31 Where possible, materials required for the construction of the development will be procured from locally available stock. The feasibility and extent to which this is possible would be identified at the detailed design stage. In addition, preference will be given to procuring materials from manufacturers and suppliers, which are accredited with an EMS including BS EN ISO 14001 or a similar standard.

## Sustainable Construction

3.32 The construction phase has the potential to cause an adverse effect on the surrounding environment. These aspects would be minimised by following appropriate procedures and best practice guidance. Principles of sustainable construction are based on methods that would be used to reduce the environmental effects during the construction phase.

### Construction Site Impacts

3.33 During the construction phase, monitoring would be conducted at appropriate frequencies to ensure that energy and resource use impacts are limited. The following monitoring activities would take place:

Monitor Waste

Waste streams would be monitored during construction. The construction site manager will keep waste transfer notes and monitor the performance of the site against recognised benchmarking figures for the construction industry.

## Adopting best practices for dust

3.34 Where necessary the spread of dust would be minimised by following best practice principles for reducing dust. This will include wheel washing and dampening down the construction site in dry weather.

### Protecting groundwater

3.35 Procedures will be established to minimise water pollution by following best practice guidance from the Environment Agency's Pollution Prevention Guidance notes (PPG's) on the *prevention of pollution (PPG1), works near to watercourses (PPG5)* and *working at demolition and construction sites (PPG6)*.

## Working Hours

3.36 Working hours would be agreed with the local authority prior to the commencement of construction. These will be restricted to the following hours:
Monday to Friday - 07.00 to 19.00
Saturday - 07.00 to 12.00
With NO Sunday working

In addition to the hours of 07.00 and 08.00 works should be restricted to vehicle movements and quiet activities to be agreed with the Planning Authority.

## Construction Traffic

3.37 The construction phase will inevitably cause a change in the usual transport patterns on the site, where plant vehicles will require access to the site. In order to limit disruption associated with this, various control measures will be employed to reduce impacts on the surrounding transport networks. Transport movements associated with construction will be managed to limit simultaneous deliveries to the site. Traffic Management plans will be produced for all Construction Sites.

## Sustainable Transport and Accessibility

3.38 The potential impact from creating more road transport demand may be reduced by increasing the accessibility of the development to sustainable transport links, local amenities as well as other day-to-day services. The proximity of the development to local amenities and existing public transport infrastructure is site specific.

## Cycle Parking

3.39 The development proposals incorporate cycle storage. The incorporation of cycle storage for the retail unit will be in operation for this purpose. Cycle parking will be compliant to design features specified within the requirements, and be secure, sheltered and located In appropriate positions around the development.

## Car Parking

3.40 Whilst methods to access the site by non-car transport are promoted, the development incorporates car-parking provision for shoppers in accordance with the car parking standards of the Local Authority. The spaces will also include compliant parking for people with

disabilities as well as parent and child spaces. In order to minimise vehicle movements generally, Aldi Stores Limited will always allow their car park to be used by shoppers visiting their store and this local area, thereby removing the need for their customers to move their car from one car park to another.

## Water Conservation and Management

## Minimising Flood Risk

3.41 The potential risks associated with flooding vary between locations. As such a Flood Risk Assessment will always be prepared based on the risk factor for a particular site. The strategy ensures that the development will not have an adverse effect on flood risk for the area. In higher risk areas, the proposals would be designed to not yield a net increase of rainwater entering the municipal drainage system following heavy rainfall.

3.42 The proposals will ensure that there is no increased risk from flooding as a result of an increase in hard surfaces on the site. Should there be an increase various Sustainable Urban Drainage (SUDS) measures will be put forward for approval to reduce the flow of water following heavy rainfall. The specific measures put forward will be dependent on the nature of the development site, as well as the risk of flooding and the ground conditions on the site. All flood risk mitigation put forward would be proposed in consultation with the local planning authority and the Environment Agency to ensure suitability. This will be dealt with as part of the detailed design stage.

### Porous paving and soakaways

3.43 Porous paving allows water to permeate through hard surfaces and soak into the ground as oppose to running across impermeable surfaces. The ability for storm water to permeate through hard standing is dependent on the ground conditions for each site. Sites where the ground is made up of clay, which is naturally able to retain water, will render this type of system less feasible than areas where soil conditions are freely draining. The Baileyfield site is expected to use porous paving to the car parking areas.

### Underground holding tanks

3.44 The use of underground holding tanks for the purposes of storing water can provide an engineering approach for reducing the flow of water into the municipal drainage system. Holding tanks are able to reduce the flow of water, and control the discharge by' throttling back' the amounts of water to represent green field runoff rates.

### Wider drainage pipes

3.45 Often the increased risk from flooding is minor, and can be dealt with by making minor enhancements to the existing drainage infrastructure on site. One way to do this is to increase the diameter of the drainage pipes, to ensure that a greater volume of water can be accommodated

## Waste Management

3.46 Waste arisings throughout the UK present serious issues for sustainability. The demand for new materials and the disposal of waste places demand on energy and resources. Subsequently, reducing the amount of waste through reuse will help lessen the demand for new resources and decrease the impact on the environment through extraction, processing and transport costs of new materials.

3.47 The UK government approach to addressing the waste problem and minimising the use of natural resources is to practise the 3R's in the Waste Hierarchy, i.e. reduce – reuse – recycle. These sustainable waste management principals will be adopted for both the construction and operational phases of the development.

## Construction Waste

3.48 Principles of the Waste hierarchy will be reflected in the proposal during the construction phase. An on-site management plan will be prepared to demonstrate how waste will be handled during the construction process. The Plan will be prepared in accordance with The DTI Site Waste Management Plans - Guidance for Construction Contractors & Clients - Voluntary Code of Practice (2004). The plan will demonstrate how waste will be handled during the construction process. Such principles will include the re-use of existing on-site materials including secondary aggregates where possible, whilst ensuring that waste arisings from the construction process will be sorted on site, disposed of responsibly and recycled where appropriate.

3.49 Where possible, materials will be reclaimed from the demolition of the existing buildings in order to reduce the amount of new material used. This practice will also benefit the amount of waste needing to be transported off-site, reducing transportation impacts.

### Recycling

3.50 Even though plans will be produced to reduce waste where feasible, certain waste arisings from the development of the site will be unavoidable. Where this is the case, waste materials will be disposed of responsibly, and recycled where materials permit.

3.51 The potential for recycling materials from the construction and demolition process would be fully investigated. Where space exists, recyclable materials such as metals, timber, cardboard and paper would be sorted on site, and segregated into separate colour coded bins. An appointed waste contractor would be used to remove these materials from the site and take them to the appropriate recycling facilities. Where space is not available on site, waste will be removed and segregated offsite by the appointed contractor.

### General Waste Disposal

3.52 Where materials cannot be recycled, this waste will be removed from the site and disposed of appropriately. All wastes would be subject to controlled collection and storage on-site, to keep the construction site tidy, avoid unsightly accumulations of waste and minimise dust, pest infestation, odour and litter. Wastes would not be stored in areas of the site adjacent to sensitive environmental features or receptors.

3.53 Licensed waste carriers would remove the residual waste from site to suitable licensed disposal sites. The disposal sites would be identified in consultation with the local authorities and the Environment Agency to ensure their suitability.

3.54 During this stage all relevant UK waste regulations would be complied with. The Construction Manager would keep waste transfer notes that fully describe the waste in terms of type, quantity and containment in accordance with the relevant regulations. This process will allow waste streams to be monitored from the site.

## Reduction of Detrimental Environmental Effects

3.55 The development will provide various measures in order to reduce, offset or mitigate detrimental environmental effects arising from the development proposals. Materials that limit the release of pollution will be used throughout in order to reduce the buildings potential to pollute.

## Watercourse Pollution

3.56 Aldi have commissioned an Environmental Management Plan to discharge condition 5 of planning permission *F/APP/2012/3841.* This document highlights further information in relation to the management of environmental impacts and effects.

## Remediation of Contaminated Land

3.57 The potential for contamination will vary from site to site and be dependent on the former use of land. As part of the construction of retail developments, there is often a requirement to remediate land so that it conforms to a higher standard of health and safety. Where land has been used for light industrial practices, ground investigations would be conducted from the site, and remedial measures taken if contaminants were found.

## Light Pollution

3.58 External lighting would be designed in accordance with guidance set out by the Institute of Lighting Engineers (ILE) to reduce the detrimental effects of night time light pollution. During the operation of the development, external lighting would be switched off outside of store operating hours to prohibit the effects of light pollution.

## Site Management

3.59 Whilst measures would be designed into the development to improve efficiency and ensure sustainability is built into the design of the development, the appropriate management of the site is also crucial in ensuring that these measures are made effective. The development would be managed during the construction and operation phases to ensure that the performance of the sustainability measures put forward are optimised. This section provides a brief description as to the scope of management measures that would be used following the developments commission to ensure both the retail component and the residential dwellings are appropriately managed.

### Commissioning the Retail Development

3.60 An individual would be appointed during the commissioning of the development to ensure that all of the commissioning is carried out appropriately. Where necessary, a separate, specialist agent would be appointed to ensure that mechanical ventilation and renewable systems are commissioned.

### Building User Guide

3.61 A building user guide would be provided for the development aimed at providing general members of staff as well as the facilities manager, information relating to the operation of the development. The manual would include details about the building's services, emergency information, the energy efficient features of the development and how to best manage these, water use, transport facilities, waste policies, information about the suppliers and installers of the fittings, suppliers of further training and useful links to further reading relating to the environment.

### Building User Training

3.62 In the first 12 months prior to the retail store opening, members of staff would be fully trained to be able to use the building to ensure optimum efficiency. The training would be based on the scope of measures outlined in the building user guide.

## Operational Management

### Environmental Management

3.63 Aldi operate an Environmental Management System and have produced an environmental statement that has been endorsed by senior management.

## Reducing Disturbance

3.64 Careful site management would be used to reduce the effects of noise on local receptors. Noise from the operation and servicing of the retail component, would be limited to 1 hour before opening and 1 hour after closing to reduce the duration of noise from the retail area.

3.65 Store deliveries would also be co-ordinated so not to disturb residents above. The store is designed with a service ramp as opposed to a scissor lift to ensure the time that vehicles stay on site is minimised and unloading noise is reduced. The vehicles would also be switched off when not being driven to further reduce noise impacts.

3.66 During night time hours, all non-essential lighting would be turned off, and essential lighting would be turned down to a reduced luminance level.

3.67 The docking bay includes a rubber dock shelter to further mitigate any noise issues from the delivery vehicles.

# 4 Summary of Measures for sustainability

| Main themes | Sub Theme | Proposed Measures to be incorporated into the development |
|---|---|---|
| Minimise Energy Use | Improving Building Envelope | Improve building fabric performance by using materials with low U values. |
| | | Reduce Air Permeability for the development. |
| | Reducing Energy Demand | Use high frequency ballasts on all Fluorescent and Compact Fluorescent Lamps (CFL's). |
| | | Detailed Specification of energy saving fitting for refrigeration system |
| | Allocation of Renewable Energy | Re-use of waste heat from refrigeration system to heat the retail area |
| Sustainable Building Materials | Material Specification | Use of recycled and secondary aggregates where possible. |
| | | Use of timber from sustainable sources, including the reuse of timber where possible, whilst procuring new timber from sustainable sources such as FSC and PEFC sources. |
| | | Use of materials that where possible have a low embodied energy, including making firm commitments to procure materials from local sources where possible. |
| | | Procuring materials will be done with consideration to manufacturers and suppliers with accredited EMS and ISO Standards. |
| Sustainable Transport and Accessibility | | Cycle parking for the site would be specified at appropriate frequencies |
| Water Conservation and Management | Water Use within the Retail | A pulsed water meter would be proposed for the development to monitor water use. |
| | | 4.5 litre water-saving delay-fill cisterns in retail store. |
| | Minimising Flood Risk | Proposals would be put forward that would not add to the flood risk in the area. A number of SUDS and engineering solutions could be put forward for this purpose. |
| Waste Management | Construction Waste | Recycling would occur during the construction phase where waste would be segregated and split into recyclable components. |
| | | General waste would be disposed of responsible and sent to licensed waste handling facilities. |
| Reduction of detrimental Environmental Effects | | Hydrocarbon traps will be placed around the perimeter of the car park area where necessary. |
| | | The development does not include materials that are toxic to humans. |
| | | All insulation materials and refrigerants have an ODP value of 0 and a GWP of 5 or less. |
| | | Where necessary, land contamination would be remediated. |
| | | External lighting will be compliant to best practice guidelines from the institute of Lighting |
| Site Management | Commissioning and Handover | A building user guide and building education would be provided as part of the development's handover |

# 5. ALDI Operation as a Retailer

5.1 Aldi goes to great length to maximise efficiency within the daily operation of the store from energy efficiency, store layout, management to operational functions within the store. Through meeting supplementary guidance outlined previously and energy efficiency calculations shown in appendix 1. A clear decrease of 30% in carbon dioxide is shown in the calculations which are in part by reusing the heat generated from mechanical plant and also by having key building elements with low U Values.

5.2 Aldi prides themselves on offering genuine quality products at heavily discounted prices. Crucial to this objective is the efficient running of operations in order to avoid having to transfer unnecessary costs on to customers. Such efficiencies also have added advantaged in making the day-to-day running of stores more environmentally sustainable. In addition to efficiency, Aldi endeavour to generally operate in a sustainable manner as a commitment to achieving a 'greener' company.

5.3 Aldi operates up to 100 stores from a company owned local regional distribution centre. The distribution centre is located close to the stores reducing delivery distances and deals with all ambient, chilled, frozen and fresh goods. The following are examples of their operation methods:

## The Distribution Depot

- At the distribution depot, goods are prepared, packaged and palleted ready for delivery straight to the shop floor of the store they are intended for. In addition to reducing the amount of packaging necessary for transportation, this also minimises the amount of vehicular movements required to each store.

- The company places strict controls over packaging to minimise waste. Only returnable and reusable crates and pallets are used. The aim is to ensure that any waste that is generated is limited to cardboard and plastics, which are then recycled.

- No racking is used in the warehouses of the distribution depot as the produces are handled to a minimum when inside the warehouse and delivered 'just-in-time' to stores.

- The warehouses are constructed in brick and built for longevity and sustainability, this method reduces the need painting and cladding which would require replacement every 20 years.

- The warehouse freezer operates on ammonia rather than R404A refrigerant. This is a more efficient and environmentally friendly method which reduces the risk of leakage into the atmosphere.

- The Aldi warehouses have automatic roller doors in a temperature controlled area to minimise heat gain and energy loss. The temperature controlled areas have de-humidifiers which reduce the number of defrosts required by reducing energy costs.

- The Aldi warehouses also have high level glazing and skylights utilising natural day light to illuminate the warehouse.

- Aldi's distribution centres operate a self tipping policy ensuring delivery drivers are not left standing with engines running.

- Aldi's distribution centres are sympathetically designed incorporating high quality planting which encourages ecological diversity.

- Aldi's depot truck washes uses recycled water.

## The Delivery Vehicles

- Aldi delivery vehicles are compartmentalised and insulated to allow different operating temperatures.

- Centralising deliveries enables Aldi to service the stores with a mixed container of ambient, fresh, chilled and frozen products thereby reducing the number of vehicles on the road whilst reducing pollution.

- Aldi route deliveries to reduce truck, movements allowing deliveries to more than one store, optimising the capacity of each vehicle.

- Aldi's delivery vehicles are fitted with Mitchelin Energy tyres for 4% greater fuel efficiency.

- All Delivery vehicles operated by Aldi operate on Dual Fuel with Diesel and LPG for maximum efficiency and lower emissions.

## The Sourcing of Products

- Each depot has an in-house Trading Director who sources local bread, produce and milk deliveries. This allows for the stores to be provided with the freshest possible product, but equally reduces vehicle movements nationally.

- Aldi is the only discount food operator that sources the majority of its products from UK suppliers, minimising vehicle movements from Europe.

- Where possible, delivery vehicles haul produce from suppliers in the area of store deliveries back to the depot. This prevents empty vehicles being driven on UK roads, increasing efficiency but also reducing emissions.

## Store Operation

5.3 The operation of each Aldi's stores exemplifies the company's view that efficiency and commercial success form the bases of a socially and environmentally responsible company.

## Warehouse

- Each store has a bespoke service pod to allow efficient unloading by the driver. The service pod incorporates a ramp which mitigates the need for tall lifts and scissor lifts. This minimises the time that a delivery vehicle stays on site. The delivery vehicles engine is never left running when stationary.

- The usual time of unloading is approximately 20 minutes, reducing the impact on the amenity of local residents and customers.

- All card and plastic packaging is collected in stores and compressed into bales and collected by Aldi delivery vehicles and returned to the central depot. This ensures fully loaded vehicles are sent for recycling of card and plastic from the central depot. Other operators have separate collections for their card and plastics and send empty vehicles back to their depots

- Any organic waste from spoilage in the store is stored in paladins and removed regularly by the delivery vehicles for safe and sustainable disposal, such as compost and animal feed.

- All Aldi stores and regional central distribution depots operate an internal mailing system. Each Aldi store has its mail delivered by its daily delivery vehicle. This is less costly for the company but also reduces the need for postal deliveries and collections.

- Aldi's store design incorporates a warehouse for storage of products at different temperatures, i.e. ambient, fresh, chilled and frozen. The Aldi warehouse has been designed as a result of years of experience to hold enough stock to prevent unnecessary deliveries, but is also of efficient size to ensure the freshest possible products and to prevent over-stocking. This efficient stock holding in their stores further reduces the need for multiple daily deliveries.

- The warehouse back-up chiller is extremely efficient as it chills sensitive products but also recycles the heat that it generates by providing heating to the warehouse. This reduces the need for a separate warehouse heating system.

- All warehouses are lit by way of minimal energy efficient lighting.

## Shop Floor

- All of Aldi's carrier bags are made of recyclable materials. A minimal charge is put on each carrier bag to discourage excessive use. Customers are instead encouraged to re-use carrier bags and boxes. Aldi promote 'Bags for Life'.

- All Aldi stores have full height glazing to the front and on the long elevation of the retail space to make best use of natural light, considerably reducing the need for electrical lighting on the shop floor.

- Aldi stores are lit by efficient recessed PL light fittings.

- Lighting is maintained at one third light level when stocking the store outside of opening hours.

- Aldi stores utilise a suspended ceiling that adds additional insulation, reducing the need to heat high level space as seen in larger retail units.

- The internal height of an Aldi store is significantly lower than other larger format food retailers, being 3.5m compared to approximately 6m.

- Outside trading times, all internal and external lights are switched off by staff when leaving the store. If staff fail to turn off appliances or lighting, a power saving circuit is activated 30 minutes after the store is closed. This is also the case with their car park lighting.

- All shop floor chillers are fitted with blinds that automatically come down after the store is closed. This saves energy by preventing cold air escaping.

- Aldi's freezer cabinets have glass sliding lids allowing the consumer to see the product whilst preventing the escape of cold air.

- Aldi's shop floor heating system is via the 'waste heat' generated from the refrigeration plant. This provides a full 100% of the energy demands for the Retail Area. The staff area's are heated separately and controlled with individual thermostatic controls.

- Aldi stores are not fitted with air conditioning due to their efficient heating systems. Instead, stores are designed to be 'self-sufficient'. External doors are not left open, but rather effective building techniques to incorporate good insulation and natural circulation enable temperatures to remain stable in both the winter and summer.

- All of Aldi's main entrances are fitted with sliding doors to minimise heat loss. Larger retailers often operate with open doors and use separate heaters above their entrance.

- Littering of external areas is kept to a minimum by stringent management regimes, whilst coin operated trolleys minimum the potential for these to be taken off site, vandalised and discarded.

# Apache Specification Information

Scottish Building Regulations 2010 Section 6 Guidance
Carbon Dioxide Emissions, U-Values, Air Permeability, and HVAC

**Project name**

## Aldi Foodstores Ltd

Date: Fri Sep 19 13:29:03 2014

## Administrative information

### Building Details

**Address:** High Street, Portobello,

### Certification tool

**Calculation engine:** Apache

**Calculation engine version:** 6.4.0.12

**Interface to calculation engine:** IES Virtual Environment

**Interface to calculation engine version:** 6.4.0.12

**Compliance check version:** v4.1.e.5

### Owner Details

**Name:** Aldi UK

**Telephone number:** 01506 657087

**Address:** Pottishaw Road, Junc 4/M8, Bathgate, EH48 2FB

### Agent details

**Name:** WSP UK

**Telephone number:** 0131 344 2300

**Address:** 7 Lochside View, Edinburgh, EH12 9DH

## 1- Predicted CO2 emission from proposed building

| | | |
|---|---|---|
| 1.1 | Calculated CO2 emission rate from notional building | 65.7 KgCO2/m2.annum |
| 1.2 | Improvement factor | 0.5 |
| 1.3 | LZC benchmark | 0.15 |
| 1.4 | Target CO2 Emission Rate (TER) | 33.1 KgCO2/m2.annum |
| 1.5 | Building CO2 Emission Rate (BER) | 13.8 KgCO2/m2.annum |
| 1.6 | Are emissions from building less than or equal to the target? | BER =< TER YES |

## 2- The performance of the building fabric and the building services systems

2.1 How do the U-values compare with Section 6 guidance?

The building follows guidance in Scottish Building Regulations 2010

| Element | $U_{a\text{-Limit}}$ | $U_{a\text{-Calc}}$ | $U_{i\text{-Limit}}$ | $U_{i\text{-Calc}}$ | Surface where this maximum value occurs* |
|---|---|---|---|---|---|
| Wall | 0.27 | 0.27 | 0.7 | 0.27 | CRCL0004:Surf[2] |
| Floor | 0.22 | 0.21 | 0.7 | 0.21 | SLS00001:Surf[0] |
| Roof | 0.2 | 0.2 | 0.35 | 0.2 | PLNT0003:Surf[2] |
| Windows**, roof windows, and rooflights | 2 | 1.83 | 3.3 | 2.5 | MTNG0002:Surf[1] |
| Personnel doors | 2 | 2 | 3.3 | 2 | CRCL0004:Surf[1] |
| Vehicle access & similar large doors | 1.5 | - | 1.5 | - | No Vehicle access doors in building |

$U_{a\text{-Limit}}$ = Limiting area-weighted average U-values [W/(m2K)]
$U_{a\text{-Calc}}$ = Calculated area-weighted average U-values [W/(m2K)]
$U_{i\text{-Limit}}$ = Limiting individual element U-values [W/(m2K)]
$U_{i\text{-Calc}}$ = Calculated individual element U-values [W/(m2K)]

* There might be more than one surface exceeding the limiting standards.
** Display windows and similar glazing are not required to meet the standard given in this table.

2.2 Air permeability

| Air Permeability | This building's value |
|---|---|
| m3/(h.m2) at 50 Pa | 7.5 |

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### 2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

| | |
|---|---|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | NO |
| Whole building electric power factor achieved by power factor correction | 0.9 to 0.95 |

1- 1_Central Air

| Heating seasonal efficiency | Cooling nominal efficiency | Specific fan power [W/(l/s)] |
|---|---|---|
| 1 | - | 1.6 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | NO |

2- 2a_Electric and MECH vent_S only

| Heating seasonal efficiency | Cooling nominal efficiency | Specific fan power [W/(l/s)] |
|---|---|---|
| 1 | - | 0 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | NO |

3- 6_Meeting Room - HRU

| Heating seasonal efficiency | Cooling nominal efficiency | Specific fan power [W/(l/s)] |
|---|---|---|
| 1 | - | 0 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | NO |

4- 4_Refrigeration_BY OTHERS

| Heating seasonal efficiency | Cooling nominal efficiency | Specific fan power [W/(l/s)] |
|---|---|---|
| 2.5 | 2.5 | 0 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | NO |

5- 2b_Electric and MECH vent_E only

| Heating seasonal efficiency | Cooling nominal efficiency | Specific fan power [W/(l/s)] |
|---|---|---|
| 1 | - | 0 |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system | | NO |

1- 5_DHW_Electric_NO storage

| Heating seasonal efficiency | Hot water storage loss factor [kWh/litre per day] |
|---|---|
| 1 | - |

**Local mechanical ventilation and exhaust**

| Zone | Supply & extract SFP [W/(l/s)] | Exhaust SFP [W/(l/s)] |
|---|---|---|
| MANAGERSOFFICE | 1.2 | - |
| MEETINGROOM | 2 | - |
| STAFFROOM | - | 0.6 |
| WC-Customer DIS ACC | - | 0.6 |
| WC-Customer FEMALE | - | 0.6 |
| WCFEMALE | - | 0.6 |
| WCMALE | - | 0.6 |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

| | Actual | Notional |
|---|---|---|
| Area [m²] | 1774.2 | 1774.2 |
| External area [m²] | 4398.5 | 4398.5 |
| Weather | GLA | GLA |
| Infiltration [m³/hm²@ 50Pa] | 8 | 10 |
| Average conductance [W/K] | 1381.43 | 1932.53 |
| Average U-value [W/m²K] | 0.31 | 0.44 |
| Alpha value* [%] | 11.82 | 10 |

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

| % Area | Building Type |
|---|---|
| 100 | **Retail/Financial and Professional services** |
| | Restaurants and Cafes/Drinking Est./Takeaways |
| | Offices and Workshop businesses |
| | General Industrial and Special Industrial Groups |
| | Storage or Distribution |
| | Hotels |
| | Residential Inst.: Hospitals and Care Homes |
| | Residential Inst.: Residential schools |
| | Residential Inst.: Universities and colleges |
| | Secure Residential Inst. |
| | Residential spaces |
| | Non-residential Inst.: Community/Day Centre |
| | Non-residential Inst.: Libraries, Museums, and Galleries |
| | Non-residential Inst.: Education |
| | Non-residential Inst.: Primary Health Care Building |
| | Non-residential Inst.: Crown and County Courts |
| | General Assembly and Leisure, Night Clubs and Theatres |
| | Others: Passenger terminals |
| | Others: Emergency services |
| | Others: Miscellaneous 24hr activities |
| | Others: Car Parks 24 hrs |
| | Others - Stand alone utility block |

## Energy Consumption by End Use [kWh/m²]

| | Actual | Notional |
|---|---|---|
| Heating | 33.55 | 33.11 |
| Cooling | 0 | 0.31 |
| Auxiliary | 8.9 | 8.06 |
| Lighting | 30.16 | 97.98 |
| Hot water | 1.4 | 2.98 |
| Equipment* | 41.44 | 41.44 |
| **TOTAL**** | **74.01** | **142.45** |

* Energy used by equipment does not count towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m²]

| | Actual | Notional |
|---|---|---|
| Photovoltaic systems | 18.89 | 0 |
| Wind turbines | 0 | 0 |
| CHP generators | 0 | 0 |
| Solar thermal systems | 0 | 0 |

## Energy & $CO_2$ Emissions Summary

| | Actual | Indicative Target |
|---|---|---|
| Heating + cooling demand [MJ/m²] | 125.04 | 47.39 |
| Primary energy* [kWh/m²] | 161.96 | 175.61 |
| Total emissions [kg/m²] | 13.8 | 33.1 |

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

## HVAC Systems Performance

| System Type | | Heat dem MJ/m2 | Cool dem MJ/m2 | Heat con kWh/m2 | Cool con kWh/m2 | Aux con kWh/m2 | Heat SSEEF | Cool SSEER | Heat gen SEFF | Cool gen SEER |
|---|---|---|---|---|---|---|---|---|---|---|
| [ST] Central heating using air distribution, [HS] LTHW boiler, [HFT] Waste Heat, [CFT] Electricity | | | | | | | | | | |
| | Actual | 160.9 | 0 | 44.1 | 0 | 12.3 | 1.01 | 0 | 1 | 0 |
| | Notional | 102.5 | 0 | 36.5 | 0 | 9.7 | 0.78 | 0 | ---- | ---- |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity | | | | | | | | | | |
| | Actual | 195.7 | 0 | 67.3 | 0 | 4.1 | 0.8 | 0 | 1 | 0 |
| | Notional | 226.8 | 0 | 88 | 0 | 6.4 | 0.72 | 0 | ---- | ---- |
| [ST] Single room cooling system, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity | | | | | | | | | | |
| | Actual | 213.5 | 0 | 25.2 | 0 | 0 | 2.33 | 1.78 | 2.5 | 2.5 |
| | Notional | 362.4 | 69.4 | 132.2 | 10.4 | 31 | 0.76 | 1.86 | ---- | ---- |
| [ST] Other local room heater - fanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity | | | | | | | | | | |
| | Actual | 79.2 | 0 | 27.2 | 0 | 6.9 | 0.8 | 0 | 1 | 0 |
| | Notional | 229.9 | 0 | 89.2 | 0 | 9.2 | 0.72 | 0 | ---- | ---- |
| [ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity | | | | | | | | | | |
| | Actual | 80.3 | 0 | 27.6 | 0 | 2.1 | 0.8 | 0 | 1 | 0 |
| | Notional | 227.1 | 0 | 88.2 | 0 | 5 | 0.72 | 0 | ---- | ---- |

### Key to terms

| | |
|---|---|
| Heat dem [MJ/m2] | = Heating energy demand |
| Cool dem [MJ/m2] | = Cooling energy demand |
| Heat con [kWh/m2] | = Heating energy consumption |
| Cool con [kWh/m2] | = Cooling energy consumption |
| Aux con [kWh/m2] | = Auxiliary energy consumption |
| Heat SSEFF | = Heating system seasonal efficiency |
| Cool SSEER | = Cooling system seasonal energy efficiency ratio |
| Heat gen SSEFF | = Heating generator seasonal efficiency |
| Cool gen SSEER | = Cooling generator seasonal energy efficiency ratio |
| ST | = System type |
| HS | = Heat source |
| HFT | = Heating fuel type |
| CFT | = Cooling fuel type |