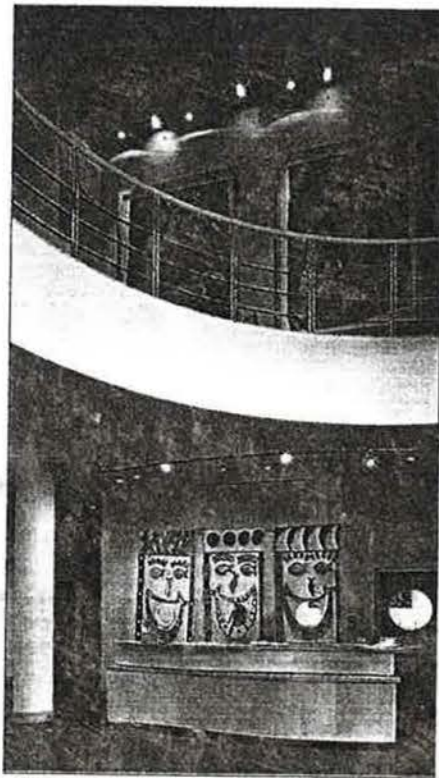


# Body-building

by Andrew Brister

**The Body Shop, the success story of the 1980s, has moved to new premises in Littlehampton. How does its new headquarters meet the company's policy of environmental responsibility? Andrew Brister finds out.**



The Body Shop makes full use of the circulation space to get its message across.

**G**etting your cosmetics from The Body Shop is like buying your knickers from Marks and Spencers – everybody does it. But whereas the M&S market domination is based on quality and value for money, the decision to buy from The Body Shop is a more emotive one.

The company's policy of not testing its products on animals, and its mission to be environmentally responsible, has clearly struck a chord with the public – over 800 stores worldwide and shops currently opening at the rate of 2-3 per week in the US are proof of the pudding.

The company has enjoyed a meteoric rise from single-store status in 1976 to become the major player it is today. But the roots of The Body Shop have stayed true to their Sussex source, even if the Watersmead site on the outskirts of Littlehampton is a far cry from the humble origins of that first shop in Brighton.

Watersmead encompasses around 40 000 m<sup>2</sup> of built space which includes manufacturing, production, warehousing, a visitor's centre, what is claimed to be the country's first purpose-built crèche and the company's new – distinctive, shall we say – headquarters building.

The building is unusual, and not only for its appearance. From its Japanese pagoda-inspired exterior you'd expect the building to belong to the realms of the eclectic owner-occupier, but in fact it was subject to a pre-let arrangement between developer Store Property Investments and The Body Shop.

Developer-led buildings are perhaps not best known for their exotic architecture, the avoidance of air conditioning and add-ons such as individual lighting controls and triple glazing, but the building is proof that a little pressure from the tenant goes a long way.

Store Property wanted a building which it felt would be lettable should The Body Shop ever move from the site, and laid down requirements for the building to accommodate air conditioning and to meet "institutional" standards regarding both height and size.

As the tenant, however, The Body Shop wanted certain enhancements to the

developer's brief, with the company being prepared to pay for extras such as lighting controls and triple glazing.

Perhaps the area where most emphasis was placed by The Body Shop was the avoidance of air conditioning and reducing energy consumption through efficient heating and lighting systems and high levels of thermal insulation.

Hence the building is something of a hybrid – a naturally-ventilated building with space set aside for the installation of air conditioning. This not only means the provision of plantroom space for possible refrigeration but also a suspended metal ceiling to hide the void which may house terminal units in the future.

## The Watersmead site

The headquarters is at the 'front end' of the Watersmead site, and is the public face to passers-by and visitors. Its appearance conflicts with the very much more functional architecture on offer elsewhere on the site, but you have to admit you can't miss it.

It is no surprise to learn that The Body Shop's dynamic founder Anita Roddick was discovering Japan at the time the building was on the drawing boards. Clearly, the Oriental touch has been applied by the architect at the probable behest of Ms Roddick.

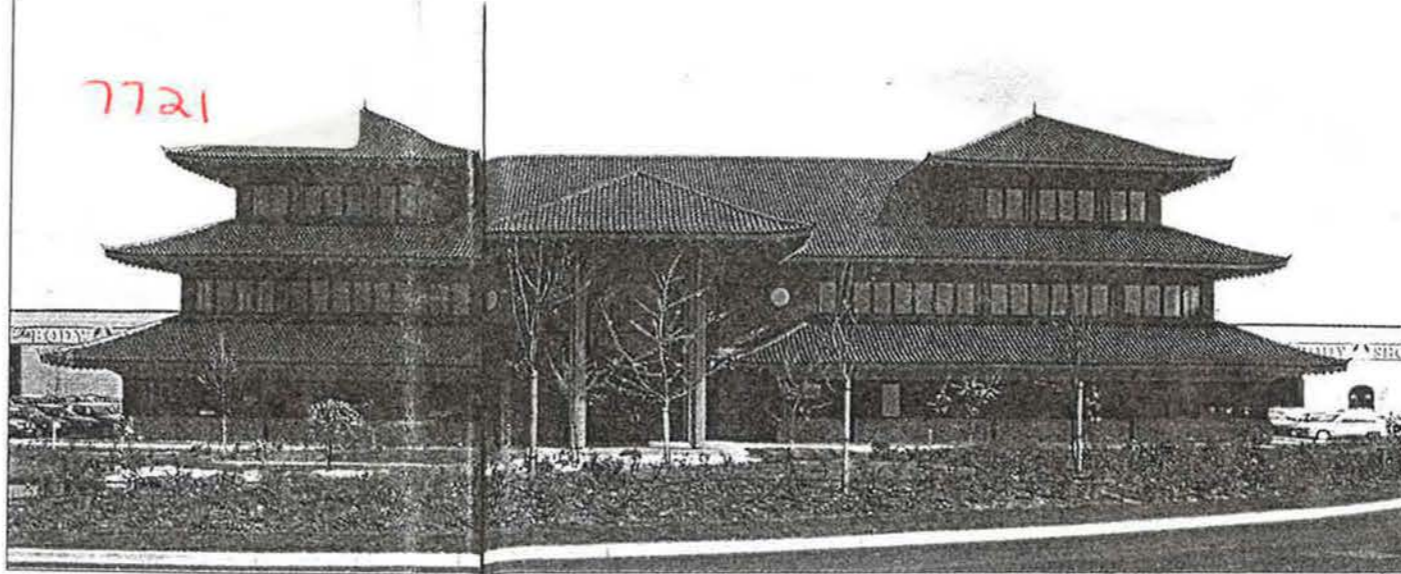
The three-storey pagoda-style building has a square plan, built around a central courtyard, whose Moorish-like fountains and greenery offer an attractive incentive for an alfresco lunch – Littlehampton weather permitting.

Although largely consisting of offices, the headquarters building does include R&D labs, a salon for testing out new products, a cinema and an American-style diner. The labs and salon form part of the route of The Body Shop's tour, which also takes in the manufacturing, production and warehousing units.

## Meeting the brief

So how have architects Michael Cook Associates and m&e designers WSP Consulting Engineers managed to marry the developer's and the client's briefs? Well, the beauty of the building lies in its simplicity, the most sophisticated aspect

BUILDING SERVICES APRIL 1993



## Building analysis

• The Body Shop hq

Left: The Far East comes to West Sussex.

Below: The three-storey pagoda-style building encloses a central courtyard.

being the lighting and its controls system. But, since the lighting is one of the only major energy consumers in the building, this is a welcome addition.

Considerable emphasis was placed by the design team and The Body Shop on thermal insulation and the materials used. External walls achieve a healthy 0.4 W/m<sup>2</sup>K through a combination of brick and blockwork, with 75 mm of blown Rockwool in the cavity. Rockwool in the pitched roof ensures a U-value of 0.247 W/m<sup>2</sup>K.

The Body Shop's decision to avoid air conditioning has led to a policy of natural ventilation via openable windows. This strategy is helped by the good design of the windows, the team opting for triple glazed Swedish unit with a U-value of around 1.75 W/m<sup>2</sup>K.

Frames are thermally broken and made from sustainable hardwood on the inside and aluminium on the outer frame. Windows are top-hung with a lockable handle provided, which allows the user to fix the window in a number of positions with varying degrees of ventilation. To reduce solar gains, the outer pane is covered with a grey anti-sun coating.

One benefit of the Far-Eastern style architecture is that it offers the chance to incorporate solar shading without compromising the look of the building. The 2390 mm overhangs on the external elevations offer a generous amount of shading while on the courtyard elevations, 1200 mm overhangs protect the first and second floors.

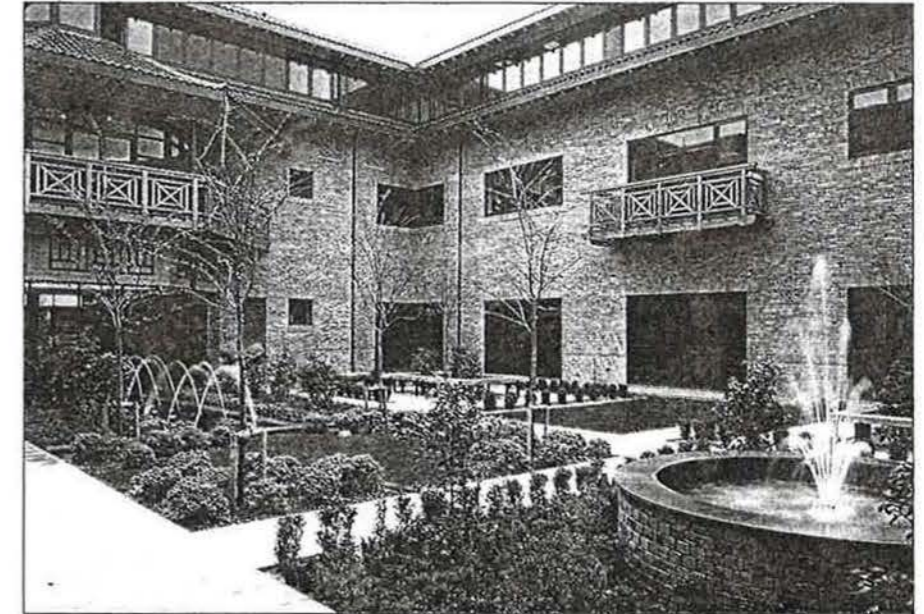
Initially, The Body Shop hoped that these measures would be enough to be able to do away with blinds, but subsequently these had to be fitted to combat glare on vdu screens.

## Lighting

With both a raised floor and a suspended ceiling in place as part of the developer's desire for future-proofing, uplighting or downlighting were both options. Uplighting was subsequently ruled out on the grounds of energy consumption.

An important factor regarding the lighting was The Body Shop's experiences at their previous headquarters building at nearby Wick, which led them to want

BUILDING SERVICES APRIL 1993



more flexibility this time around. That building had centrally located banks of switches which inevitably meant that lights were left on whether or not they were needed.

Some staff had found lighting levels too high, and so for the new building the company wanted the ability to dim locally. WSP initially proposed a system based on presence detection but, to include The Body Shop's desire for dimming, attention turned to the IFS 800 system from Philips.

The IFS 800 is a fully-programmable microprocessor-based system. Here it controls ceiling-mounted luminaires containing fluorescent lamps with high frequency ballasts.

The system is configured to turn on all the lights at 50% illumination when the cleaners arrive at 4.30 am. The lights are then switched off when the cleaners leave at 7.30 am. As staff begin to arrive, presence detectors activate stair lighting to light the way to the offices, then the staff switch on 'corridor' lighting within the open-plan office to reach their desks.

Once at the desk, occupants use hand-held infra-red controllers to switch on the ceiling-mounted luminaires, the controllers also allowing them to dim from 500

lux downwards. While this system undoubtedly comes with a pretty hefty price tag, the advantages are obvious; no-one else's lighting is turned on unnecessarily and energy use is kept to a minimum.

In the evening the system starts to shut down the lighting, but any staff working late can use their controllers to switch lights in their area back on. Further reductions in unnecessary use are ensured by linking those luminaires nearest the window to the available light and switching off accordingly.

## Heating

The heating system is a straightforward lphw system fed by a modular gas-fired boiler housed in a basement plantroom. Radiators are fitted with thermostatic radiator valves.

The building is split into two zones, north and south, which are designed to be compensated (variable temperature lphw) and optimiser-controlled.

The laboratory areas on the ground floor of the building have mechanical ventilation, primarily because of the risk of dust getting in if the windows were opened. These have been designed to have cooling coils installed at a later stage

## Building analysis

• The Body Shop hq

### Minimising/avoidance of air conditioning

The Body Shop's headquarters is one of the buildings monitored for the BRE's research project "Minimising/avoidance of air conditioning", the assessment being carried out by Max Fordham & Partners. To assess the efficacy of the natural ventilation strategy, temperatures in the offices were measured between August and October of last year.

An external temperature logger was placed under the porch of the north side of the building, while internal air and globe temperatures were measured in the centre of a typical office and also in an area of high equipment density. Readings were taken 1.7 m above floor level.

The monitored period in the summer was not very warm; the maximum external temperature recorded was 27°C on Friday 7 August. This was the only occasion when the temperature exceeded

the 50 day/10 year CIBSE benchmark of 25°C (see figure 1).

Internal temperatures in the typical office area are superimposed on the same graph. The differences between globe and air temperatures were so small as to be disregarded. Temperatures did not exceed 27°C on the warmest days, despite the gains. These were calculated to be as follows:

- lighting: 4.5 W/m<sup>2</sup>;
- equipment: 12.2 W/m<sup>2</sup>;
- people: 10.6 W/m<sup>2</sup>.

It is believed by many building designers that one of the main features which is necessary for a naturally ventilated building is a high thermal mass. This building provides evidence that this is not so, provided that other features such as the lighting controls, good window design, low level partitioning and overhangs are there to take its

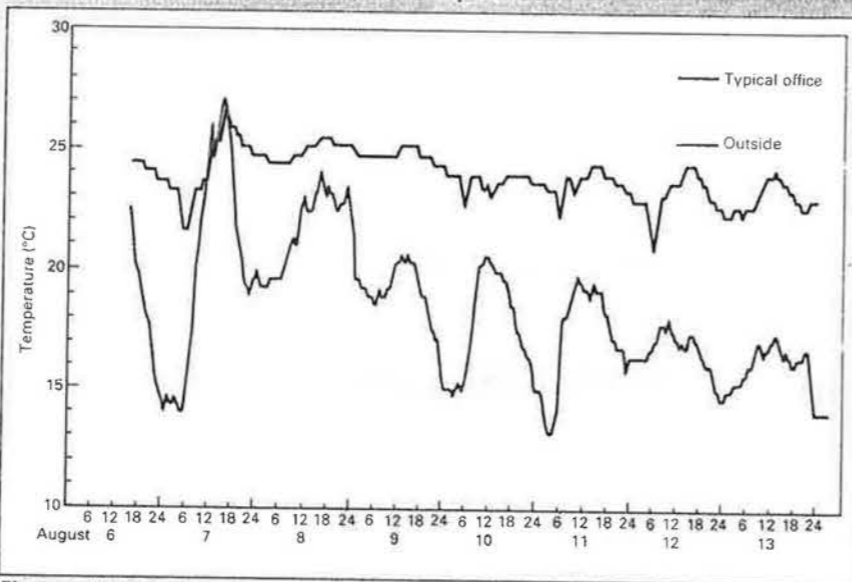


Figure 1: How temperatures in a typical office space vary with outside temperature.

Elsewhere, the building is exemplary, earning credits in all relevant categories. Avoiding lead-based paints, asbestos and urea formaldehyde insulation ensures all three credits for hazardous materials, the fluorescent lighting has high frequency ballasts, domestic water is designed to CIBSE's *TM 13* and, of course, there is no wet cooling tower.

As far as wood products are concerned, Romanian beech and European oak have been used throughout. This, along with sourcing the plywood from European redwood, ensures a credit for only specifying wood products which have originated from sustainable sources.

#### Experience in use

So the \$64 000 question — can a building this simple provide a comfortable environment for staff? After all, there is no climate modifying double wall, no sun-tracking blind systems and not even a par-

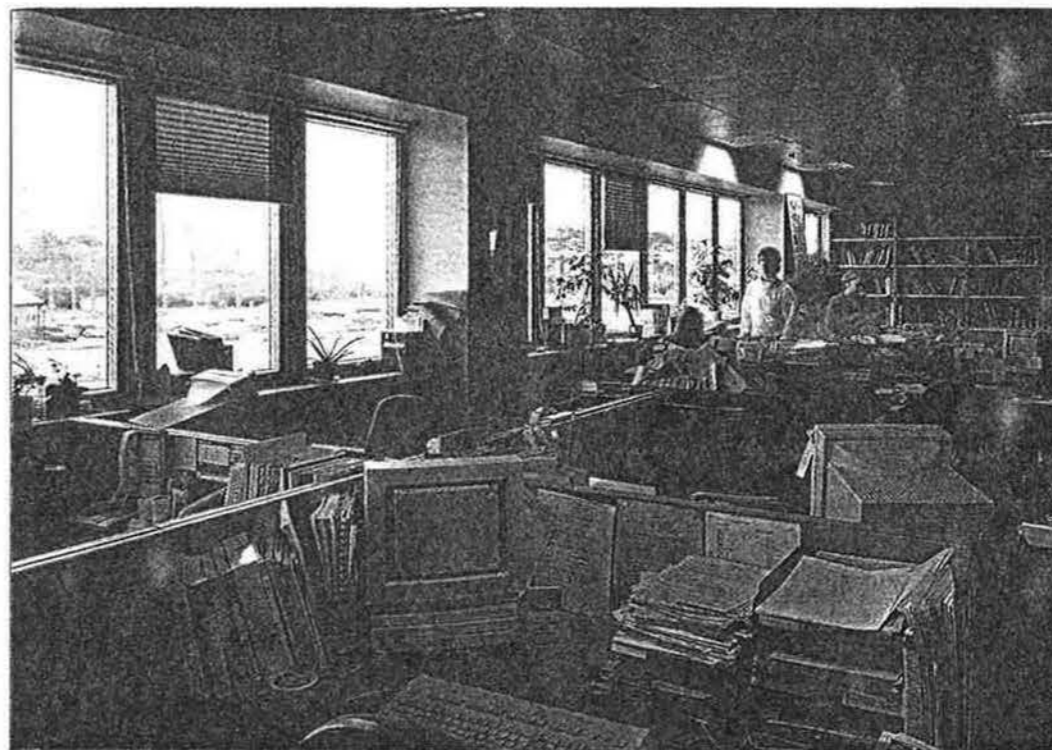
ticularly high thermal mass.

Well the good news is that the staff seem extremely happy with their environment. The Body Shop moved into the building in November 1991 and so they have worked through a summer season, always the acid test for the naturally-ventilated building.

One of the reasons for such a happy workforce must be the high degree of control available to the staff. Windows can be opened, lights can be switched on or off and dimmed, blinds can be dropped etc. Staff don't feel that the building is being controlled by Big Brother.

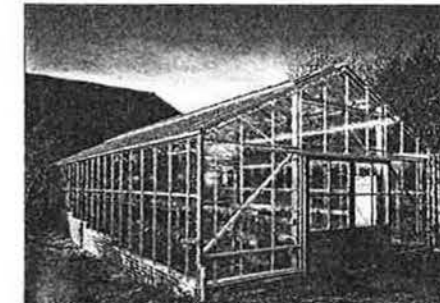
In general office areas there were little or no complaints of overheating during summer (see box for results of the BRE's monitoring programme for the building).

The crossflow ventilation principle appears to be working well, and is helped by the predominantly open-plan offices, with low level partitioning (around 1-



Left: Staff exercise their control to the full. Note how the use of lighting and blinds varies.

Below: The Body Shop is developing micro-habitats which promote the breakdown of organic material in the company's waste water.



orientation. However, each radiator is fitted with trv control.

#### Philosophy

If the measures mentioned so far do not go beyond that of any other energy conscious organisation, let a visit to the site convince you that the company really is trying to make a difference.

The visitor's centre provides the starting point for a tour of the Watersmead site. Buggies charge around depositing onlookers at several points around the r&d, quality control, manufacturing, production and warehousing chain.

Propaganda? Certainly there is an element of the catch-them-while-they're-young syndrome about the mainly school-based trips, but full credit is due for opening the doors to the often secretive world of manufacturing.

The visitor's centre aims for near self-sufficiency in terms of energy, a 15 kW wind turbine and solar panels meet the bulk of the building's space heating and domestic hot water needs. The turbine also supplies the electricity needed to charge up the tour buggies.

The Body Shop has plans for a turbine on a much grander scale, however. The company hopes to negate the CO<sub>2</sub> emissions arising from the Watersmead site,

if conditions become unbearable.

All areas fitted with mechanical ventilation, including the toilet supply and extract, have run-around coils to recover any waste heat.

#### BREEAM assessment

The headquarters building was put forward for the BRE's environmental assessment scheme, BREEAM 1/90 being the current version at the time. The idea with BREEAM is to carry out an initial assessment early on in the building's design strategy, so that the design team can make improvements before a final certificate is issued. At The Body Shop, however, the rating has been carried out after the staff have moved in — a little late for the usual two-stage assessment.

Nevertheless, the building scores very highly and, in terms of its impact on the environment, is significantly better than a conventional office building. Indeed, as far as greenhouse gases are concerned the building achieves five credits out of a possible six, with a predicted CO<sub>2</sub> emission of only 43.6 kg/m<sup>2</sup>/y.

This is one of the lowest ratings achieved under BREEAM and reflects the attention that has been paid to reducing energy consumption. The natural ventilation plays a large part in this, and also ensures a credit for avoiding ozone-depleting refrigerants.

Unfortunately, the building did not earn a credit for avoiding cfc's and hcfc's in the insulation. While the Rockwool used in the walls and roof fits the bill, Dow's Floormate 2000 is used as perimeter insulation in parts of the floor. This is an extruded polystyrene which uses HCFC-142b as a blowing agent. This would undoubtedly have been replaced if the assessment had highlighted it earlier on in the design programme.

1.5 m) seemingly not too much of a hindrance.

The building does have an increasingly deep plan as you descend the floors; the top floor's 13 m is perhaps more conducive to natural ventilation than the ground floor's 18 m. Hence the ground floor is generally made up of non-office space such as the labs, diner, etc.

While the suspended ceiling does of course take away some of the room volume (floor-to-ceiling height is 2.7 m), the BRE's monitoring results show that internal temperatures are not prone to large swings in warm weather. The compromise between designing for natural ventilation and designing for future proofing seems to be very successful.

Occupancy levels for the 230 staff work out at around 13 m<sup>2</sup>/person, which is fairly generous and will impact favourably on comfort levels. However, the design was originally based on 9 m<sup>2</sup>/person which, if staffing levels did rise, could make a difference, particularly when the extras and partitioning are brought into the equation.

Perhaps one of the most important factors is that the office is not a suit and tie environment; T-shirts make things more tolerable on those rare days when Britain basks in Mediterranean temperatures.

The staff are also more in tune with energy and the environment than in most organisations which definitely affects the efficacy of the lighting control system. After an initial settling down and training period, the infra-red controllers do seem to be used to their full capacity, with individuals adjusting light levels to suit both the daylight available and their personal taste.

Glare on vdu screens has meant that blinds have had to be fitted. It is not clear how much this will affect the lighting

levels, but it is possible that there will be a tendency for the blinds to be dropped and left that way, with an attendant rise in lighting use.

Anti-sun coatings can result in increased lighting use, purely because of the way they are perceived, but that doesn't seem to be the case at The Body Shop.

While running cost data has not been made available, there was a prediction made at the time of the BREEAM assessment using the Esicheck program. Figures work out at 35.18 kWh/m<sup>2</sup>/y for electricity and 72.34 kWh/m<sup>2</sup>/y for gas.

The total of 107.52 kWh/m<sup>2</sup>/y is exceptionally low even for a naturally-ventilated building. Indeed, the Energy Efficiency Office's *Energy Consumption Guide* gives a Good Practice target of 156 kWh/m<sup>2</sup>/y for this type of building, with typical buildings often reaching 285 kWh/m<sup>2</sup>/y.

Even so, The Body Shop has an ongoing priority to improve energy efficiency, and last year employed the services of the March Consulting Group to carry out an energy audit for the Watersmead site as a whole.

While most of March's findings related to the manufacturing facilities, it did make some recommendations for the offices. The first was to reduce lighting energy by careful planning of the cleaning schedule; instead of lighting the whole building for the 3 h cleaning period, it should be possible to fully clean one area of the building before moving onto the next, thereby minimising the lighting in use at any one time.

March also considered the heating and its controls to be too simplistic. Ideally, it was felt that more control zones should have been provided to reflect the different heating characteristics brought about by

## Building analysis

• The Body Shop hq



**Above and right:** The Body Shop opens its doors to visitors, the tour taking in r&d, testing, manufacturing, etc. A 15 kW turbine helps to make the visitor's centre near self sufficient in energy terms and supplies the electricity needed to charge the tour buggies.

the company car fleet, its distribution system and the UK shops by developing a renewable energy scheme to generate electricity with no CO<sub>2</sub> penalty.

Currently awaiting planning permission is a 10 MW wind farm, to be built in Wales in a joint venture arrangement with National Wind Power. The scheme, once it is up and running, allows The Body Shop to be safe in the knowledge that no-one is building nuclear power stations on its behalf.

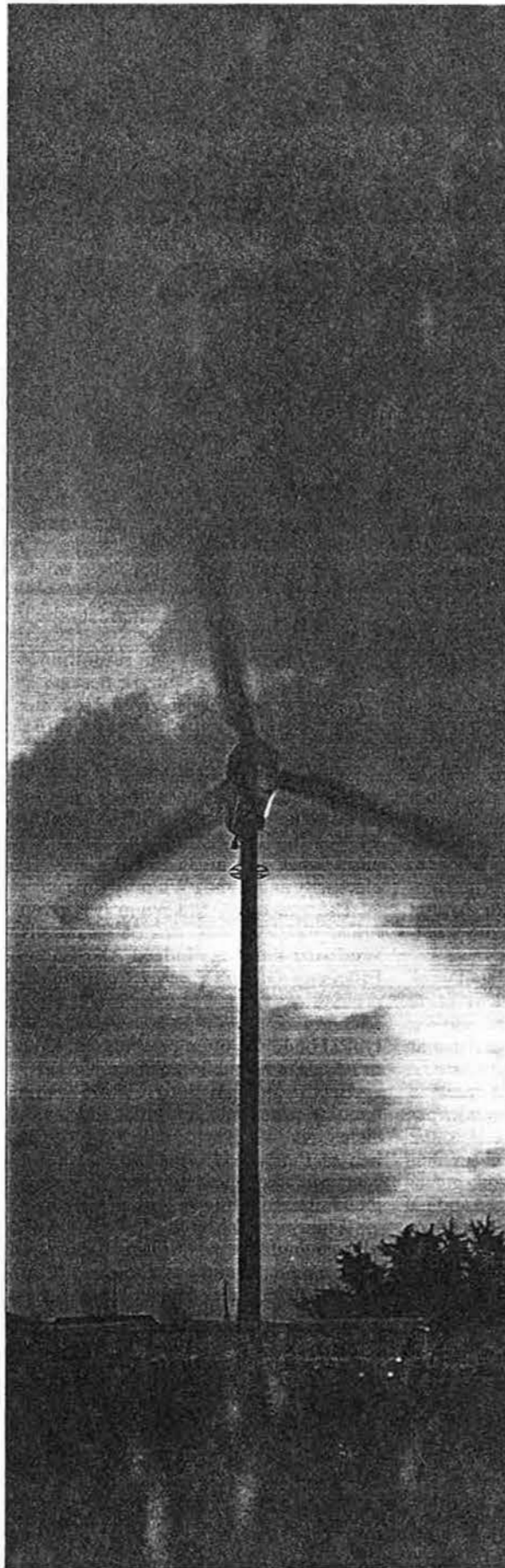
The company's convictions in this respect extend to the negotiation of its electricity supply contract. Over the Watersmead site as a whole, The Body Shop consumes more than 1 MW of electricity and is free to take its business where it pleases.

While the local electricity company Seeboard have been very good with the supply, The Body Shop decided to place its contract with National Power because it had more of a commitment to renewable sources of supply.

Non-commercial decisions such as this lead by example, and definitely set change in motion. As a result of the lost business, Seeboard will have to think long and hard over its renewable strategy.

I could go on - the crèche, the company's research into innovative forms of water treatment and its recycling policy are all laudable. Where else would companies canvass the opinions of the staff through message pads in the toilets?

While it is fashionable to look for a chink in the armour of those trying to make a difference, surely that is missing the point. Better to hope that industry and commerce adopt just some of the measures which The Body Shop wholeheartedly embraces.



The Body Shop headquarters, Watersmead, Littlehampton

Client

The Body Shop International plc and Store Property Investments

Architect

Michael Cook Associates

M&E consulting engineer

WSP Consulting Engineers

Structural engineer

Gyouri Self Partnership

Quantity surveyor

Edmund Shipway & Partners

Main contractor

Store Property Construction

Mechanical contractor

Lorne Stewart

Electrical contractor

Haven Electrical

Main suppliers

Boilers: Ideal Standard

Burners: Ideal Standard

Pressurisation: Holden & Brooke

Pumps: Pullen Pumps

AHUs: York Thermal Technology

Motor control centres: Concord

Controls

Toilet extract: NuAir

Grilles and diffusers: Royair

Dampers: Airflow Developments

Coils: Unicoil

Louvres: Waterloo

Luminaires: Philips

Lamps: Philips

Lighting controls: Philips

Sound attenuation: EPL

Water treatment: Aldous & Stamp

Valves: Hattersley

Calorifiers: Rycroft

Fire alarms: Wormald Britannia

LV switchgear: Centre

Switchgear

HV switchgear: Brush/Seeboard

Controls: Centre Switchgear

Lifts: Lutz

Engineering data

Total area gross: 6350 m<sup>2</sup>

Net useable area: 5400 m<sup>2</sup>

Offices: 3000 m<sup>2</sup>

Occupancy

Offices: 9 m<sup>2</sup>/person

Meeting rooms: 6 m<sup>2</sup>/person

External design conditions

Winter: 4° sat

Summer: N/A

Internal design conditions

Winter: 21°C

Summer: N/A

Circulation & toilets: 18°C min

Loads

Heating load: 400 kW

Heating system

Boiler capacity: 450 kW

controlled in nine 50 kW stages

LTHW: 80°C flow, 70°C return

Noise levels

Offices: NR 38

U values

Walls: 0.4 W/m<sup>2</sup>K

Roof: 0.247 W/m<sup>2</sup>K

Glazing: 1.75 W/m<sup>2</sup>K

Electrical supply (to complete site)

2 MVA supply

2 x 1000 kVA transformers

Lighting

Offices: 500 lux (variable)

Lifts

1 x 10 person @ 0.63 m/s

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