Teacher Notes – Level 1

Sustainability: Copenhagen – A case study of the sustainable use of an urban environment

Geography

Context:

Research Case Study – Copenhagen: The Eco-city of Europe

Copenhagen has been described as one of the most sustainable cities on earth so therefore makes an ideal case study.

Conceptual Strand:

Place and Environment - Students learn about how people perceive, represent, interpret, and interact with places and environments. They come to understand the relationships that exist between people and the environment.

Achievement Objective(s):

Level 6: understand how people interact with natural and cultural environments and that this interaction has consequences.

Level 7: Understand how people’s perceptions of and interactions with natural and cultural environments differ and have changed over time.

Level 8: Understand how people’s diverse values and perceptions influence the environmental, social, and economic decisions and responses that they make.

Possible Achievement Standards which could use a European Context:

- AS 91009 1.3 Demonstrate geographic understanding of the sustainable use of an environment – Copenhagen as an example of an urban environment

- AS 91241 2.2 Demonstrate geographic understanding of an urban pattern – looking at the development of green transport networks in Copenhagen.

Geographic Concept:

Sustainability:

Adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing, limiting, minimizing or correcting environmental damage to water, air and soil, as well as considering ecosystems and problems related to waste, noise, and visual pollution.
Skills:

- Geographic resource interpretation skills – using an atlas to locate places, locating places on satellite images, interpreting a climate graph
- Geographic resource construction skills – constructing a map of Europe
- Communication skills – writing paragraphs, oral presentation to class/peers.

Notes on the possible use of this resource:

- These resources were designed to be:
  o formative work for AS 91009 1.3 Demonstrate geographic understanding of the sustainable use of an environment – could be used as a formative activity to introduce the concept of sustainability before the summative assessment is undertaken.

- They could also be adapted for the following uses:
  o AS 91241 2.2 Demonstrate geographic understanding of an urban pattern – looking at the development of green transport networks in Copenhagen
  o practise for AS 91429 3.4 Demonstrate understanding of a given environments(s) through selection and application of geographic concepts and skills. There is no reason, however, why they could not be used by an able level 2 or even level 1 student who is need of extension.

Video clips:

- General intro to Copenhagen (8:59 min): [http://www.youtube.com/watch?v=WX2jTAC8uSE](http://www.youtube.com/watch?v=WX2jTAC8uSE)
- No1 for quality of life (3.31 min): [http://www.youtube.com/watch?v=AbzI-IDSJ5g](http://www.youtube.com/watch?v=AbzI-IDSJ5g)
- Overview of Copenhagen sustainability (particularly architecture) (4.23 min) [http://www.youtube.com/watch?v=F9D_8ncP2GQ](http://www.youtube.com/watch?v=F9D_8ncP2GQ)
- How the City of Copenhagen stays both sustainable and profitable - Global Observatory (2.17 min) [http://www.youtube.com/watch?v=77krPyOeePU](http://www.youtube.com/watch?v=77krPyOeePU)
- Future city – district cooling(4:31 min) [http://www.youtube.com/watch?v=M1kJNr7BBY4](http://www.youtube.com/watch?v=M1kJNr7BBY4)
- Copenhagen Bike Paths - An Example To All Cities (6.09 min) [http://www.youtube.com/watch?v=ZtX8qjICrXE](http://www.youtube.com/watch?v=ZtX8qjICrXE)
- Winds of change – discussion of wind power in Denmark (23.57 min) [http://www.youtube.com/watch?v=QsblkrvZmww](http://www.youtube.com/watch?v=QsblkrvZmww)
- Copenhagen's Offshore Wind Farm Puts Water & Energy On Display (3.07 min) [http://www.youtube.com/watch?v=aDoJMgXZJMY](http://www.youtube.com/watch?v=aDoJMgXZJMY)
- Green Copenhagen - overview of sustainable measures (4.58 min) [http://www.youtube.com/watch?v=p_GixjLTmnl](http://www.youtube.com/watch?v=p_GixjLTmnl)
- CNN – Future Cities – Copenhagen (6.13 min) [http://www.youtube.com/watch?v=i97K93S6QJc](http://www.youtube.com/watch?v=i97K93S6QJc)

Copenhagen: Solutions for Sustainable Cities 2011

Copenhagen – A case study of the sustainable use of an urban environment

In this activity you will look at how the Danish City of Copenhagen is attempting to produce an urban environment which is totally sustainable.

How do people use the Copenhagen urban environment and why do they use it like this?

Getting to Know the Copenhagen environment

1. Use an atlas or the internet to locate and label the following:
   - Shade and label Denmark on map A
   - Shade and label Denmark on map B
   - Label the following on map C. The countries of Denmark, Sweden, and Germany; the cities of Copenhagen and Malmo; the Øresund Bridge, The North Sea, The Baltic Sea
2. Refer to Map 1. What is the latitude and longitude of Denmark?

Latitude: _________________________   Longitude: ___________________________

Refer to Resource 1.

3. For how many months is the mean minimum temperature below 0 degrees? ________________

4. What is the temperature range in December? ________________

5. Compare Copenhagen to the city or area you live in?

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________________________________________________________________________

6. What impact do you think Copenhagen’s cold winter climate could have on the environment? (think especially in terms of energy use)

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Why the Copenhagen environment is used for urban activities

- Explain how the location of Copenhagen has been important in its development into one of the leading cities of Europe.

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Some uses of the Copenhagen environment

Copenhagen is an urban environment and as such it is used in a number of ways which we call land-uses. Examples of land uses we would expect to see in a large city include:

- residential
- commercial
- tourism
- transport
- manufacturing
- education
- recreation

Annotate the outline map of Copenhagen on the next page show at least FOUR examples of the land uses mentioned above.
Uses of the Copenhagen Environment
What are the consequences of this use on people and environment?

In any city the size of Copenhagen the land uses explored above is going to have consequences for the environment and people. Some of these consequences are listed below:

- waste water treatment
- Providing fresh water
- Air pollution
- Loss of natural spaces
- Traffic congestion
- Contributing to global climate change
- Waste management
- Managing Energy usage
- Loss of green spaces
- Noise pollution
- Providing sustainable employment
- Providing sustainable municipal management
- Managing Energy usage
- Providing sustainable municipal management

Place each of the issues identified above in the appropriate place in the diagram below according to whether you think they are issues for people, the environment or both.

Choose ONE issue from each part of the diagram above and briefly explain why you placed it where you did.

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Copenhagen has been awarded the title of European Green Capital 2014. Their application form, found at [http://ec.europa.eu/environment/europeangreencapital/winning-cities/2014-copenhagen/copenhagen-application/index.html](http://ec.europa.eu/environment/europeangreencapital/winning-cities/2014-copenhagen/copenhagen-application/index.html), provides a lot of information on the issues faced and what the city is doing to overcome these as it seeks to become more sustainable.

- Your class will be divided into 12 groups and each one will be allocated one of the issues identified above.
- Each group will become an expert on their issue by researching it at the European Green Capitals website (click on the link if you are viewing this online). If not go to [www.ec.europa.eu](http://www.ec.europa.eu) and type European green capital into the search box – click on the ‘0.9335 European Green Capital | Green Cities Fit for Life’ result.
- Use the table below to summarise this information.
- Once each group has gathered their information they will report it back to the class.
- You will need to write down a summary of each issue in the

<table>
<thead>
<tr>
<th>Data Gathering Table</th>
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<tbody>
<tr>
<td>My Issue:</td>
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<table>
<thead>
<tr>
<th>Nature of the Issue</th>
<th>What Copenhagen is doing about it</th>
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<table>
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<tr>
<th>Summary Table</th>
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<tr>
<td>Issue</td>
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<td>waste water</td>
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<td>Providing fresh water</td>
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<td>Noise pollution</td>
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<td>Providing sustainable employment</td>
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<tr>
<td>Providing sustainable municipal management</td>
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</tbody>
</table>

**How sustainable, or not, is Copenhagen in its use of this urban environment?**

Write a report in which you identify and fully explain with supporting details and named examples, and using geographic terminology and concepts:

- Explain the steps taken to minimise the impacts of urban activity on the environment.
- Explain the sustainability of the continuing use of the environment for urban activity.
Need satellite image and map of copenhagen for précis map, distance question, direction (Oresund bridge, grid reference,

Resource 1

Long Term Climate Data for Copenhagen, Denmark (1961-1990)
Photo 1: Satellite image of Hedegaardsvej, Copenhagen. The approximate position of the street views below is indicated by the yellow shape.

Photo 2: Street view looking south

Photo 3: Street view looking north
THE BIKE SUPERHIGHWAYS OF DENMARK

50% of all Copenhageners cycle to their place of work or school in every day, even when it is hangered outside the morning boundary.

68% of all Copenhageners cycle at least once a week.

COPENHAGEN IS CONSTANTLY EXPANDING ITS NETWORK OF CYCLE TRACKS. RIGHT NOW THE CITY HAS:

350 km OF CYCLE TRACK

23 km OF CYCLE LANES

43 km OF GREEN CYCLE ROUTES

EVERY TIME THE CITY CREATES A NEW CYCLE TRACK, IT RESULTS IN...

20% MORE CYCLISTS AND 10% LESS CARS

The City of Copenhagen: biannual survey from 2010
Copenhagen: From sewer to harbour bath

In Copenhagen, Denmark, many years of investments in the sewage system has revitalised the harbour. The revitalisation is mainly due to a remarkable reduction in the discharge of wastewater during rainfall. This case focuses on how municipal strategies and investments towards cleaning up the harbour have resulted in a water quality so high that people can now swim in the harbour. In 2002, a public harbour bath opened in the area of Islands Brygge. Today, the harbour bath is a striking urban oasis that marks Copenhagen’s position as a clean and liveable city.

For many years, the discharge of wastewater from sewers and industrial companies had a major impact on the water quality in Copenhagen harbour. The water was heavily polluted with sewage, algae, industrial waste and oil spills from commercial harbour transport.

In 1995, 93 overflow channels fed wastewater into Copenhagen harbour and the adjacent coastlines. Since then, the municipality has built rainwater reservoirs and reservoir conduits, which can store wastewater until there is space again in the sewage system. This has resulted in the closing of 55 overflow channels. Today, wastewater is only discharged to the harbour during very heavy rainfall.

Municipal investments in a modernisation of the sewage system and an expansion of the city’s wastewater treatment plants, which are to remove nutrient salts and minimise discharge of heavy metals, has revitalised the harbour of Copenhagen. In 2002, the first public harbour bath opened in the area of Islands Brygge, making Copenhageners among the few people in Europe able to bathe in their harbour without jeopardising their health. An established on-line warning system calculates and monitors the water quality in the harbour. If the water quality is poor, the swimming facilities are immediately closed.

Today, Copenhagen harbour is almost as clean as the water in the Sound. The high water quality and the popular recreational bathing facilities along the harbour front are some of the elements in the city’s vision to become the capital city in the world with the best urban environment by 2015.

"It is crucial for people worldwide to understand that water, as well as waste water, is a valuable resource that needs to be handled imaginatively and frugally. 'Waterproofing' our cities require the involvement not just of specialists, but of everyone." Herbert Girardet "CitiesPeoplePlanet" (2008)

Source: Danish Architecture Centre
Copenhagen: Cities can run on wind energy

The Danish Government is aiming to turn 50% of Danish electricity consumption into offshore wind power by 2030. In 2000, the city of Copenhagen took part in a large offshore wind farm project called Middelgrunden two kilometres off the city's coastline. The project was to produce energy for the city. Although wind power produced locally in Copenhagen is for national consumption this case shows that cities can be visionary and produce energy themselves.

In 2000, the city of Copenhagen took part in a large offshore wind farm project two kilometres off the city's coastline. The project is based on a partnership between the municipality and local shareholders. Wind energy is not the energy source that immediately springs to mind when thinking about renewable energy in cities. Few cities have enough space within their area to build large wind farms. It is more common to find small wind turbines on suitable locations or even on buildings.

The wind farm 'Middelgrunden' consists of a slightly curved line of 20 turbines, each with a rotor diameter of 76 m and a generator size of 2 MW. Wind turbines are expensive to build, whereas the operating costs are low. Denmark tops world consumption of wind power with 22 per cent of its total electrical consumption produced in wind turbines in June 2005. This compares to a mere 6 per cent in neighbouring Germany and 0.5 per cent globally. Middelgrunden does not produce electricity specifically for Copenhagen. The wind power production bought by energy company Dong Energy and sold to national as well as international customers.

Denmark was a pioneer in developing commercial wind power during the 1970s. Today almost half of the wind turbines placed around the world are produced by Danish manufacturers, such as Vestas Wind Systems A/S. The Danish government in the 1980s and 1990s was supporting wind energy development. This resulted in a dramatic reduction in the cost of wind-generated electricity. To promote investments in wind power families were offered tax deductions if generating their own energy within their own or the neighbouring municipality. This incentive resulted in the creation of numerous wind power cooperatives. In 2001, more than 100,000 Danish families were members of a wind power cooperative.

Middelgrunden Vindmøllelaug is the largest of its kind in the world with 8,600 owners. Middelgrunden wind power park is 50% financed by 10,000 stockholders in Middelgrunden Vindmøllelaug and 50% financed by the municipal energy supplier in Copenhagen, Copenhagen Energy.

"Public resistance against wind turbines in the landscape is and has been one of the largest barriers to the development of wind power - and thus to the development of an environment friendly and sustainable energy supply. This counts both for Denmark and other countries. At the moment, there is though a wide support for wind energy in Denmark"

Source: Danish Architecture Centre
Copenhagen: Waste-to-Energy-Plants

Copenhagen, Denmark, is no longer using landfills as a general solution to its waste problems. Instead, the city has been trying its best to reduce waste and use that which is produced as a resource that can be recycled or incinerated for energy. This case presents the waste management system of Copenhagen in 2008 and specifically focuses on 'Waste-to-energy' plants, which presently produce heat and power for the city.

Like many other European countries, Denmark has radically changed its waste management strategies in the last 10 to 20 years. Landfills, which used to be the general solution, now only accept only 3% of Copenhagen's total rubbish. As an alternative, 39 % of all material the city collects is incinerated in "waste to energy" plants that generate power for thousands of households and make use of the valuable energy contained within the city's trash.

In 2004, the amount of heat and power generated from waste in Copenhagen was enough for the needs of 70.000 households, producing 210.000 MWH of electrical energy and 720.000 MWH of heat. All of this valuable energy was obtained from the city's three municipal waste incinerators: I/S Amagerforbrænding, I/S Vestforbrænding, and Rensningsanlæg Lynetten.

In addition to incinerating 39% of collected materials for energy, Copenhagen also recycles 56 % of them according to the motto: less waste, more separation. The system is able to achieve such a high percentage of recycled materials because it is flexible - taking into consideration the different needs and habits of every citizen and business along with their different time schedules. The improvement of Copenhagen's recycling system alone has reduced its CO² emissions by 40.000 tons since the system's initial implementation.

Perhaps most important, the city has been working to promote waste reduction by influencing consumer habits. This may include making products with less packaging more attractive or available, encouraging the reuse of products, establishing composting schemes, or organizing other activities that can minimize waste.

"Waste is better utilised through incineration than through landfills but recycling is an even better option. Of course, the best option is prevention of waste production altogether, which often requires direct reuse. The less waste, the better - it's as simple as that. "Copenhagen Waste Solution, City of Copenhagen (2008)

Source: Danish Architecture Centre
Metro

New York, Hong Kong, Moscow, London, Washington, Barcelona, Paris, Stockholm, Rome and Tokyo all have one. Now Copenhagen is on board.

With 21 km of tracks, 22 stations, and 34 subway trains, Copenhagen has got on board, quite literally. On a weekday in one of the busy winter months, some 130,000 passengers take the Metro.

Since the first two stages were completed, it has become easier to get from one side of Copenhagen to the other.

The third stage, to the airport, opened in September 2007, and the fourth stage, a circular line called the City Ring, is scheduled to open in 2018. The City Ring will take the form of a 15-km-long tunnel that will link large parts of downtown Copenhagen, Østerbro, Nørrebro, Frederiksberg, and Vesterbro that are not yet serviced by the local trains or other Metro lines.

The City Ring will take passengers from Østerbro to Vesterbro in less than 10 minutes. A whole round trip with the City Ring will take 23-25 minutes.

Minimalistic design

Emphasis in designing the new Metro was on taking passengers quickly and safely to their destination. The platforms are only intended for short stays, since they are emptied every 2nd or 4th minute when the Metro trains glide in.

Daylight under ground

The Metro's trademark is a five-metre-tall column at each station that can be seen far and wide and gives information on departures on an electronic display. But these columns are not the Metro's only distinctive feature. The underground Metro stations differ from stations for other subway systems because they are illuminated by daylight. Asymmetrical glass pyramids above ground reflect daylight into the stations and the platforms 18 metres below.

BEST IN THE WORLD

In April 2008, industry leaders from the world's metropolises chose Copenhagen's Metro as the best in the world. The most important factor in the decision to award the prize for best metro to Copenhagen was the dependability of its service, together with the quick and efficient manner in which the section of the line to the airport was built, and the high levels of passenger satisfaction and safety.

Source: Danish Architecture Centre
Copenhagen: The world's best city for cyclists

The Danish capital aims to be the world's best city for cyclists in 2015. The bicycle is already considered to be the obvious means of transport by most Copenhageners because the city council has made a concerted effort to improve the infrastructure, safety and parking facilities for cyclists.

Every day, 55% of all Copenhageners cycle to and from work, jointly pedalling more than 1.17 million kilometres a day.

Bike lanes, cycle parking and special traffic lights for cyclists are part and parcel of the Copenhagen cityscape. The infrastructure has been meticulously planned to show consideration for more than 150,000 citizens for whom the bicycle is their chosen form of everyday transport. The city has some 340 km of cycle lanes and the vast majority of major roads have cycle lanes in both directions, either as separate tracks or delineated by markings at road level.

On selected stretches through the city - between main residential areas and the centre - so-called 'green waves' have been implemented. Series of traffic lights are timed to allow cyclists to ride the entire stretch without stopping at a red light if they maintain speed of 20 km/h. The ‘wave’ functions on the way into the city in the mornings and on the way out at the end of the working day. At traffic lights, cars stop 5 m behind the cyclists' stop line and the cyclists have their own miniature set of traffic lights that give them priority over motor vehicles. Safety measures such as 'cycle pockets' at traffic lights are currently undergoing trials. The 'pockets' make space for cyclists to stop in front of the cars at red lights. This makes the cyclists more visible, especially to lorries, and accidents occurring when vehicles turn right are avoided.

Bicycle parking problems have been solved by the installation of bike stands throughout the city; on streets, in public parking lots and private underground car parks or sheds at most housing complexes. Shopkeepers are also making life easier for cyclists by placing bike stands in front of their shops. Despite the change of the seasons it is possible to cycle all year round in Copenhagen. When it snows, the council clears the snow off the cycle lanes before starting on the roadways and 70% of cyclists keep on cycling. If the weather does become too much of a challenge it is also possible to take your bike with you on the train or underground.

It is Copenhagen City Council's vision to be hailed the world's best city for cyclists in 2015 and they are striving continuously to improve conditions for cyclists. Growth in the use of bicycles in Copenhagen has increased the need for more, wider, safer cycle lanes. New cycle lanes can accommodate 15-20% more bicycles and reduce the number of cars in the cityscape by 10%. Proposals have also been presented for the imposition of a congestion charge on motor vehicles to reduce the number of cars in the city centre, increasing the use of cycles and public transport.

The citizens of Copenhagen are neither cycling fanatics nor environment activists - they simply use a bicycle as a means of transport because two wheels get them quickly and safely from A to B.

Source: Danish Architecture Centre
District Heating and Cooling

Though not as visible as Copenhagen’s bicyclists and wind turbines, its heating and cooling infrastructure is playing a key role in slashing CO2 emissions. One of Copenhagen’s most innovative infrastructure projects is the Adelgade cooling plant, sheltered within the brick-clad shell of a retired power plant in the historic city center. Opened in June 2010, the plant is the hub of the country’s first district cooling network and a model of climate-conscious engineering.

The Adelgade plant draws cool seawater from an intake pipe located near the picturesque Nyhavn Canal and then delivers the chilled water through insulated pipes to buildings; the pipes are located below ground in the same tunnels in which steam is distributed via Copenhagen’s district heating network. Thomas Grinde, an engineer with Copenhagen Energy — a private firm owned by the city — took me on a tour of the plant. He said that every degree Celsius saved by pre-cooling with seawater saves 15 percent on electricity at the site’s absorption chillers. The city estimates that district cooling reduces carbon emissions by nearly 70 percent and electricity consumption by 80 percent compared to conventional air-conditioning.

From the cooling plant, Grinde drove me south to the Amager power station complex, which sprawls across a spit of land jutting into Copenhagen’s indoor heating comes from combusting waste.

Copenhagen Harbor. There, a pilot project supplies geothermal heat directly into the district heating system. In March, construction began nearby on a clean-burning waste-to-energy plant that will provide electricity and heating to 150,000 households. According to Mayor Jensen, half of Copenhagen’s indoor heating comes from combusting waste.

The two major combined heat and power (CHP) stations that serve Copenhagen, Amager and Avedøre, largely burn coal. But because waste heat from the stations is sent to the district heating system, they operate at around 90 percent efficiency, compared to around 40 percent for conventional coal-fired power plants. Rather than use furnaces or boilers located in individual buildings for heating, Copenhagen delivers hot water or steam to radiators via a network of pipes covering 98 percent of the city.

Under the climate plan, district heating is to be carbon neutral by 2025. The Amager and Avedøre plants, which today burn a limited amount of biomass imported from Poland, Russia, Sweden, and the Baltic countries, will replace coal entirely with wood chips and straw certified as sustainable by the Danish Energy Association.

Source: Yale Environment 360
Copenhagen and its green roof ambitions

Copenhagen is the first city in Scandinavia to have a mandatory green roof policy. The new policy makes vegetation and soil a mandatory obligation in planning. The policy covers all roofs with less than a 30° pitch and also covers refurbishment of older roofs. However such roofs will get some public financial. The green roof policy is part of a wider ambition the City has to be carbon neutral:

‘Copenhagen has set itself the ambitious target of becoming the world’s first carbon neutral capital by 2025. To meet this ambitious goal we need ambitious measures. Therefore we have now decided to ensure the City adapts to extreme weather conditions by making new requirements for getting grass on top of as many buildings as possible,’ - Mayor of Technical and Environmental Administration, Bo Asmus Kjeldgaard.

The City of Copenhagen has set out four requirements for green roofs. Buildings with green roofs should be able to meet at least two of the following effects:

- Absorb 50-80% of the precipitation that falls on the roof.
- Provide a cooling and insulating effect of the building and reduce reflection.
- Help make the city greener, reducing the urban heat island effect, counteracting the increased temperatures in the city.
- Contribute to a visual and aesthetic architectural variation that has a positive effect on the quality of life.
- Double the roof life of the roofing membrane by protecting it against UV rays etc

Today about 20,000 m² of the roofs in Copenhagen are flat and at least 30 buildings have green roofs. It is envisioned that new development should add 5000 m² per year – though this is only aspirational as it will depend on the development cycle and economic factors.
Copenhagen: No.1 Green hotel in the World.

At first sight there is nothing green about the recently erected hotel in the heart of Copenhagen. Yet, the blank facades have integrated panels and TripleLynx inverters that make the Crowne Plaza hotel the first energy efficient hotel in Denmark and one of the first of its kind in the World. It combines the largest facade integrated solar Photovoltaics (PV) installation in Denmark and frontline energy-efficient technology, cutting energy consumption by 53% compared to conventional hotels. The building is estimated to save 1,373 tons of CO2 on an annual basis.

Massive energy savings on winter-heating and summer-cooling

The Crowne Plaza Copenhagen Towers was erected in 2009. Aside from this ingenious concept, the hotel is known as the first in Denmark to receive all of its energy through renewable and sustainable sources. Solar panels and a groundwater-based cooling and heating system helps the Crowne Plaza conserve precious resources. The Crowne Plaza Hotel is located in the center of the city, where more than 300 rooms await your arrival and are spread across 26 floors. Crowne Plaza hotel is built in accordance with the Danish Low Energy Class 2 standard, which means that the energy consumption must not exceed 42.6 kWh per m2 per year. This corresponds to savings of 53% when compared with conventional buildings in Denmark.

Solar panels and a groundwater-based cooling and heating system helps the Crowne Plaza conserve precious resources. One of the key energy saving initiatives is the installation of a groundwater based system, is based on the idea of recycling energy, and provides both heating and cooling to all 366 hotel rooms, the conference room section, kitchen, restaurant, and the ancillary office building. This system is the first of its kind in Denmark, and it saves up to 90% of the energy used for climate regulation inside the hotel.

A lot of additional energy-saving and environmentally as well as socially-friendly measures are applied inside and in addition to the building. For instance a intelligent control of lighting and low-energy light sources, LED flat screens in every hotel room and computer-control of all electronic equipment. This ensures the consumption is kept as low as possible especially when rooms are vacant. Furthermore, all of the components of the hotel's IT infrastructure were chosen on grounds of energy-efficiency and degree of reusability. Moreover, a whole range of other pumps in the building, circulate water in the hotel's internal heating and cooling system.

The hotel is more than what you expect from a regular hotel. Not because of the high standard in general but because of the high environmental and social awareness which imply for the entire hotel from staff, over interior design, organic decomposing toilet requisites, energy producing gym facilities etc. The rooms are overlooking the skyline of Copenhagen and the Øresund Region. And guests can skip the mini-bar and hop on an exercise bike, generate electricity, and earn points for a free meal in the restaurant.

"The bikes invite the guests to move in new ways that benefits their personal health and wellbeing as well as the environment at large. The guests litterally provide the energy in the hotel. On one hand, the biking might represents a symbolic sustainable act. Yet on the other it also presents that the socio-eco-awareness now also apply for the service sector.” Managing director for Crowne Plaza Copenhagen Towers, Allan L. Agerholm.

The free meal idea was started as an alternative method to boost guests' health and shrink their carbon footprint which benefits the local environment and the World at large. The bikes are hooked up to several generators that require guests to pedal for about 15 minutes to produce 10 watt-hours of electricity. iPhones attached to the bikes display the amount of power being generated. It takes someone in relatively good shape to produce up to 100 watt hours in 60 minutes. Thus, if you are into healthy living, sustainability, and planning a trip to Copenhagen - you might wish to make your stay socio-eco-friendly - the hotel is defiantly the place to stay. The Crowne Plaza Copenhagen embraces an innovative green concept that benefits the hotel, its employees and the guests.