



CLIMATE CHANGE PARTNERSHIP HANDBOOK

by
Paola Triolo

Table of Contents

**PART ONE:
BACKGROUND INFORMATION**

<i>Introduction</i>	Page 4
<i>The Episcopal Power and Light Program</i>	Page 5
<i>The Causes of Climate Change</i>	Page 7
<i>The ARC Climate Change Partnership</i>	Page 8

**PART TWO:
HOW TO IMPLEMENT AN ENERGY-SAVING PROGRAMME
If you can't measure it, you can't manage it**

	Page 12
How to establish a successful environmental programme	Page 12
• <i>Reviewing your current position</i>	
• <i>Establishing a programme and planning future improvements</i>	
• <i>Auditing and communicating your achievement</i>	
• <i>Energy chart</i>	
• <i>Gas chart</i>	

**PART THREE:
PRACTICAL SOLUTIONS**

	Page 23
<i>What can be done</i>	Page 24
Specifics on Practical Solutions	Page 26
• <i>Temperature Control</i>	
a. <i>Insulation</i>	
b. <i>Heating</i>	
c. <i>Cooling and Air Conditioning</i>	
• <i>Electrical Appliances</i>	
• <i>Lighting</i>	
• <i>Transport</i>	

Practical Suggestions	Page 32
------------------------------	---------

**PART FOUR:
CONCLUSION and APPENDICES**

Conclusion: Let's Preserve It	Page 42
<i>Appendix 1: Lightbulb Information</i>	Page 44
<i>Appendix 2: Suggested Bibliography</i>	Page 45
<i>Appendix 3: Internet Addresses</i>	Page 46
<i>Appendix 4: Statement of commitment</i>	Page 47



PART ONE:

**BACKGROUND
INFORMATION**

INTRODUCTION

This booklet focuses on practical ways for communities of all religions to confront the very real problems of climate change, from the auditing of electrical consumption through to the use of political influence.

Climate change, often referred to as 'global warming,' is one of the most important and possibly devastating problems confronting the human race. The effects of climate change are still uncertain, but could potentially include the extinction of certain wildlife species, such as polar bears and coral reefs, the flooding of low-lying areas from Pakistan to London, huge agricultural problems due to changes in precipitation patterns, and the spread of tropical diseases such as malaria. The chief cause of climate change is human activity. The link between gas emissions, overuse of energy resources, and changing weather patterns has been well established, and many organisations, both religious and secular, have publicly expressed their worries about the rising economic, humanitarian, and cultural effects of climate change.

One of the chief causes of climate change is overuse of energy resources. This booklet has been produced by ARC, the Alliance of Religions and Conservation, in order to help faith groups all over the world use energy in a manageable, financially sound way that does not damage the planet. Sponsored by WWF-UK, WWF-International, MOA International and the Pilkington Foundation, ARC was founded in 1995 in order to assist and encourage environmental work among the religions, and works closely with all of the world's major religions. ARC has already raised the issue of climate change with the major religions, and the response of the faith groups led to the launch of new schemes worldwide.

For example, the Sikh community in India has launched an initiative to reduce the amount of fossil fuels used in their *langars* (kitchens) of Delhi's Gurdwaras. These *langars* feed millions of people daily. After an energy audit, energy-savings measures will be introduced in Gurdwaras, homes and workplaces, followed by an initiative to develop and promote environmentally sustainable energy sources. The heating, lighting and cooking energy requirements at Delhi's eight largest Gurdwaras will be reduced by the use of solar power. Gurdwaras in rural areas will be fitted with fuel-efficient cooking equipment. The combined results of these initiatives will reduce energy consumption in these Gurdwaras by 10 to 15 per cent.

In the U.K. the Union of Liberal and Progressive Synagogues is conducting environmental audits in all its Synagogues. While in the U.S.A, the EpisCoPal Power and Light Ministry is strongly promoting renewable energy. These are a few examples of the work religious groups have started recently to conserve energy.

However, much remains to be done. Hopefully, no matter what the religion or resources of your particular community, you will find ideas in this booklet that you can build upon, and which will stimulate debate within your community. The world of religious groups is vast and diverse, but it has also proved to be

receptive and sensitive. With the current impasse on national action on climate change, faith communities can provide one way to break the deadlock.

THE EPISCOPAL POWER AND LIGHT PROGRAM

In the general scheme of things, churches, mosques, synagogues, temples and other houses of worship do not consume as much energy as manufacturing industries or commercial establishments. However, as religious congregations increasingly emphasize the connection between their faith and the threat of global warming, there emerges the possibility of a new and powerful force for change.

Changes, which in the beginning may be small, can be replicated at a local level and expanded to a regional, national, and international level. This is what has happened in the US with the *Episcopal Power and Light Program*. The programme helps the 8000 Episcopal churches in the US assess energy consumption and address areas of energy waste in their facilities, switch to more renewable forms of electricity, and encourage parishioners to do the same by making power more affordable and establishing an incentive program that benefits the church. When parishioners in northern California switched to green power for their home electricity supply, the power company donated money to the church. This case study illustrates the benefits of aggregating purchase power to obtain lower rates for green power, the need for building incentives into an energy efficiency and green energy program, and demonstrates the power of numbers when actions are replicated within a local church and among churches nationwide.

In addition, to serving as role models of energy efficiency and clean energy choices, the religious community can exert a tremendous amount of influence when its millions of members adopt energy efficient and clean energy choices in their homes and work lives.

This initiative developed a previously unimaginable knock-on effect when the *Episcopal Power and Light* leadership joined with the *California Council of Churches*, which represents 3,400 congregations of many different faiths, to set up an *Interfaith Power and Light Program*. Now, the *National Council of Churches* of the US comprising 340,000 U.S. congregations, and the *World Council of Churches* are starting to develop similar programmes, in so doing the initiative will be spread even more widely.

THE CAUSES OF CLIMATE CHANGE

Climate¹ has changed throughout human history. Hot or cold periods particularly– the most famous being the Ice Ages – are nothing new. In the 17th century, the river Thames would freeze so solid during the winter that a fair could be held on it; recently, it hasn't frozen for two centuries.

However, the speed of climate change has greatly increased in the last 200 years. Overall, global temperatures have risen, an analysis of temperature records shows that the Earth has warmed an average of 0.5°C over the past 100 years², which may not seem like a great amount, but has had huge consequence. This can seem a modest increase, but likely consequences include: the spread of tropical diseases; disruption of agriculture due to drought and changes in rainfall patterns; elimination of many now endangered species; increasing numbers of deaths during summer heat waves; and increasingly severe tropical storms. Human-activity induced weather has been on the news very often recently. Greenhouse gases are keeping more heat causing devastating problems in the natural balance. Air currents can be exacerbated causing typhoons and storms, which, consequently, can trigger big climate disasters like the recent floods in India, Honduras and other countries in Central America. The root cause is the 'greenhouse effect.'

The greenhouse effect is so named because certain gases in the earth's atmosphere act like the panes of a greenhouse, trapping a portion of the heat rising from the earth's surface and reflecting it back. Without this effect, the earth would virtually be an ice planet – perhaps some 30-40°C colder – and not a very pleasant place to live.

What's the problem, then? Well, human industrial and agricultural activities – such as burning coal, chopping down forests, and raising cattle – have greatly raised the levels of certain greenhouse gases; carbon dioxide, methane, and nitrous oxide. Since the beginning of the industrial revolution, the concentration of carbon dioxide in the atmosphere has risen by 30%, the concentration of methane has more than doubled, and nitrous oxide concentrations have gone up 15%.

¹ Climate and weather are not the same thing. Weather is the day to day change in temperature, precipitation (rain, snow), humidity, sunshine and wind that occurs in a specific location. The climate of any location is a summary of the past weather events that have occurred. This summary also shows what it is expect over the long term.

From year to year, every place on Earth experiences a distinctive and fairly regular pattern of weather. There is variation, but generally the amount of sunshine, rain and snow, the range of temperatures, and other aspects of the weather are similar from one year to the next. It is this average weather that we call climate. However, climate is much more than that. It takes into account extremes, surprises, anomalies and variability. Globally, climate is affected by the complex interaction of all the major elements of the climate system: the sun, the land, the sea, the air, the Earth's ice cover, its plants and all other life forms (human origin factors are among these).

² Anon, *What is Climate Change?*, available at <http://www.ec.gc.ca/climate/whatis/index.html>, [accessed 06 June 2001].

ARC CLIMATE CHANGE PARTNERSHIP

As well as working to encourage general action and debate on climate change among the religions, ARC operates a specific initiative on climate change in conjunction with WWF (the World Wide Fund for Nature), called the *ARC Climate Change Partnership*³. The aim of this initiative is to bring the views and influence of the religions into the international discussions on climate change.

Developing an international policy on climate change is nothing new - the first international climatic change conference was held at Geneva in 1979 under the auspices of the United Nations. These discussions continued in Vienna in 1985 and in Montreal in 1987, during which a levelling off of ozone depleting emissions was broadly agreed.

Climate change was again placed on the international agenda at Toronto in 1988, and was one of the main subjects covered during the UN Conference on the Environment and Development (UNCED), held in Rio in 1992. One of the products of that very important conference was the Framework Convention on Climate Change (FCCC), which came into force in 1994. The convention includes commitments about emission reduction and although it did not contain specific timetables, many of the 166 signatories committed themselves to the stabilisation or reduction of emissions by the year 2000 or 2005.

All parties to the Convention were obliged to develop national inventories of greenhouse gases and to present to the Conference of the Parties (CoP), the supreme body of the convention, a description of their plan of action. The CoP would then review and implement these plans.

Almost immediately after the meeting in 1992, it became clear that the voluntary stabilisation targets by 2000 would never be achieved. Parties to the treaty decided, in 1995, to enter into negotiations to establish legally binding limitations and reductions in greenhouse gas emissions, because current convention commitments were inadequate. This round of negotiations was intended to develop limitations only for the developed countries.

Following completion of the Protocol in December of 1997 in Kyoto, details of a number of difficult issues remained to be negotiated and resolved. The fourth Conference of the Parties (CoP4), held in November 1998 in Buenos Aires, was still unable to resolve these issues. Instead, the parties established a two-year 'Buenos Aires action plan' with a deadline for completion set for the end of 2000 or in early 2001, at CoP6, in The Hague.

In preparation for The Hague, the Alliance of Religions and Conservation (ARC) and WWF introduced a Climate Change Partnership Initiative to

³ Please note that at page 42 (Appendix 4) it is possible to fill in *The Statement of Commitment* to join ARC's *Climate Change Partnership* at any stage. If any religious groups and community groups wish to do so, please photocopy page 42 and send it or fax it to ARC (at the address provided on the same page).

underline religious groups' concern about climate change and its consequences. The depth of concern faith groups had about these crucial issues became clear when ARC started sending out the information pack for the Partnership, to be presented to the CoP6 in The Hague. With this initiative ARC invited the faiths to lead by example, by working in partnership with the environmental agencies to determine targets for energy saving and reduction in emissions. The response from the faith was far greater than anticipated.

ARC took its Climate Change Partnership initiative (CCPI) to The Hague, only to witness the failure of the CoP6. The climate talks crashed and delegates went home having failed to resolve the biggest environmental problem facing the world today. Unfortunately, the United States and its accomplices, Canada, Australia and Japan, came to The Hague with an inflexible position, insisting on a treaty that would effectively allow them to increase rather than reduce emissions.

The COP6 failed to reach the targets environmental agencies and concerned groups had hoped it would achieve. Nevertheless, for ARC, the meeting was a success. ARC's partnership proposal was formally advocated by the Minister for Nature and Environment of Mongolia on Tuesday 21st November as part of his presentation to the parties. Document CoPies of the proposal were formally circulated to Ministers of all nations by the UN FCCC Secretariat on behalf of the Mongolian minister. It now stands as an official proposal tabled by Mongolia within the framework of CoP6. As such, all national governments present at CoP6 are invited to take up the partnership. This means ARC and WWF can now follow up nation by nation on the basis of the proposal being in the public domain of the national governments present at CoP6.

This achievement therefore marks the beginning of the first ever official international partnership between faiths and national governments.

The significance of ARC's CCPI is that it gives the opportunity, through faith networks, for a strong involvement of the civil and commercial society by bypassing the present reliance on governmental action. The partnership concept has already attracted groups from civil society. For example, ARC has been approached by schools from Zambia, businesses and several NGOs in the USA and by hospitals and schools in India. The civil society version of the Kyoto Protocol, so created, will constitute a collective programme of research leading to action.

With the breakdown of negotiations on the Kyoto Protocol and the fact that the US has subsequently pulled out from the Kyoto Protocol altogether, a religious action becomes more urgent than before.

The next phase of development for the ARC Climate Change Partnership create the following opportunities:

- To provide a way for ordinary, concerned citizens who belong to Faith groups worldwide, to still take a role in change.
- To provide one of the ways for Nations to work on emissions reductions as a national stance (perhaps at least to some degree decoupling the initiative from the disputed Kyoto Protocol).

- To provide a way for interested Nations to join with other Nations in offering Partnerships with their faith groups, working in the context of CoP but not burdened by the official process.
- To still provide an initiative that will remain open to all groups within all faiths and to all Nations regardless of the current official political line on Climate Change.
- To build upon the growing desire of civil society to be involved at a practical level.

The first major discussion of a Religious/Secular Partnership will be held in association with the governments of Mongolia and Mexico. Mongolia and Mexico will work to secure an inner coalition of countries who have agreed to form their own government/religious partnership and advocate this to other nations.

This coalition of National Governments, led by Mongolia, will then write to the environment ministers of all countries, inviting them to join in formal accepting the faiths' offer. This will be formalised during a meeting in late Spring 2002, during which an appropriate emission reduction for each nation will be set out.



PART TWO:

HOW TO IMPLEMENT AN ENERGY-SAVING PROGRAMME:

***If you can't measure it,
you can't manage it***

During the *International Conference on Sustainable Building* held in Maastricht in October 2000 one of the representatives from Africa was asked what Sustainable building meant in Africa. He answered that it meant more cultural knowledge than technical knowledge. He summarised the African principles as:

- Use no more than you need (sufficiency).
- Respect life and relationships between species (spirituality).
- Nature cannot be owned, but man should take good care of it (stewardship).
- Without respect and attention to others there can be no peace and prosperity (social responsibility)⁴.

These four principles can be used in every sector. And if they are applied as they stand energy saving programmes can be started immediately.

Unnecessary energy consumption must be prevented and the more efficient technology (see Part Three: Specifics on Practical Solutions, page 26) must be applied at the point where the energy is actually used. It is for this reason that houses of worship can play a decisive role in the implementation of climate protection measures. What is more, the orientation of their energy to the abatement of CO₂ emissions and the reduction of energy consumption gives them a whole series of ecological and economic gains: minimization of risks, abatement of environmental and noise pollution, operating cost savings and positive effects upon the regional economy.

⁴ Van Hal, A. and Rover, R., 2001, Inspiring Continents at SB2000, *Sustainable 2001 Building*, **No. 01**, p. 9.

How to establish a successful environmental programme

Establishing a successful environmental programme requires both a systematic approach to improve day-to-day operations behind the scenes, and communicating your environmental message to all believers and the local community.

Therefore, the different parts of an emissions reduction plan will involve:

- Reviewing your current position
- Establishing a programme and planning future improvements
- Auditing and communicating your achievement

★REVIEWING YOUR CURRENT POSITION

The best way to review your current position and to reduce CO₂ emissions is by checking your consumptions. The best way to do this is to keep track of them through charts of the measurements (an example of charts can be found on pages 20 and 21). This can be done everywhere, at home, at work, in any house of worship. The first thing to make sure is that somebody is in charge of the task. Moreover, consumptions should be checked regularly, even once a month. This can be done by checking metres regularly. The review becomes the first step towards establishing a programme for future improvements.

STEPS:

- 1.** Make sure is that somebody is in charge of the task.
 - a.** Within your congregation you could find one or two people who will be willing to check your consumption. Do not forget that everyone has a contribution to make. You will not be surprised to find out that, among your congregation, there will be plumbers, electricians, builders and so on who can help to improve your performances. There will be also people willing to do their best for their place of worship, for their own house and for their impact on Nature.
- 2.** Check your system to assess if it works properly and switches off when you do not need it because it wastes energy and money as well.
 - a.** Improving your control can make a big difference. The best solution is to have a timeswitch or programmer. So your heating control will switch on and off automatically at a set time for a set period.
- 3.** Use common sense.
 - a.** The best way to implement climate protection measures is to make use of common sense. Common sense can really help choose the approach and/or improve performances.
 - b.** Together with the congregation you should be able to come up with creative ways to green your house of worship from turning off lights and computers when they are not being used to suggesting technical innovations in energy and, also, water efficiency.

☀ *Establishing a programme and planning future improvements*

Used properly, a review will highlight the most important, or significant, of your environmental effects. Thus it will help to identify potential risks and the sCoPe for making improvements in the building's operation.

- ▶ After having collected records of your actual consumption and your facts about energy costs (these including bills and tariffs over the last 12 months) you will be able to draw a programme to identify where you want to start from. In fact, the programme should address the main impacts of your building and opportunities for reducing them:

- ✦ *Energy management, including the consumption of fuel and sCoPe for savings.*
- ✦ *Waste avoidance, re-use, recycling and disposal.*
- ✦ *Purchasing.*
- ✦ *Hazardous materials.*

▶ The programme will identify weakest areas of your management and improvements you should invest on. Some of the improvements can be very cheap (see Part Three: Practical Suggestions, page 28). However, any initial expenditure should be seen as an investment which in the long-term will repay itself as well as reducing the overall production of CO₂.

STEPS:

1. INSULATION

Insulation should be one of the first things to be checked and where you may want to make improvements.

- a.* Find your draughts. Just hold up the palm of your hand to your windows and doors. Wherever you feel cold air coming in that means that warm air is going out and you can easily lose 20 percent of your heat through tiny gaps.
- b.* Outside doors, windows and letterboxes can be fitted with special seals to prevent heat from going out and being substituted by cold air. Most draught proofing material is very cheap and can be bought in any DIY shops. The quality of the material will affect its performance and its durability. Materials like foam, brushes or rubber strips and sealants, to name just a few, are widely available and easy to fit.
- c.* In many hot and temperate countries these measures can be useless. Especially those about insulation. But houses of worship can always have an important leading role in reducing energy consumption. Solar power, for example, can be used in those regions of the world blessed by constant sunny days. The role of renewable energies in these countries can become a means of bridging the gap between the energy needs of economic development, especially in rural areas, and the ability of both the traditional and the conventional modern energy sectors to meet this need. And the places of worship can put their efforts in testing and promoting them. Solar photovoltaic, for example, can be used both for heating and cooking purposes.

2. RECYCLING

- a.** Within your future enhancements you may want to have a recycle plan in place. Such a plan would help to reduce the impact of your house of worship on its surroundings. Recycling has been shown to be especially valuable in shrinking one's carbon footprint, reducing nearly 2,500 pounds of CO₂ emissions per ton of recycled waste.
- b.** It is important to have a comprehensive environmentally-oriented purchasing plan in place to encourage the purchase of recycled content products, FSC-certified wood and paper, remanufactured toner cartridges and renewable energy would count for CO₂ emission reductions.

☀ *Auditing and communicating your achievements*

After having collected historical data, costs (this can be done using the tables on pages 18 and 19), utility contracts, statistics, and having applied new conservation measures you can audit your achievements

STEPS:

- 1.** You can check your achievements by seeing the difference between the bills before and after the implementation of your programme. These achievements should be public and available for your congregation.
- 2.** You may want to publish some guidelines or a small diary following what the congregation has been doing for the house of worship in order for them to apply it at home and/or at their workplace.
- 3.** Set a congregation-wide awareness programme. When there is such a programme, it will encourage environmental practices even outside the place of worship
- 4.** Using posters, brochures, newspaper articles, and lectures to explain what is at stake is another thing a place of worship could do to raise awareness among its congregation. Posters and brochures can be easily available from Environmental Agencies, such as WWF, and also from Governmental Environmental Agencies.
- 5.** You can measure your progress by seeing the difference between the bills before and after the implementation of your programme. These achievements should be public and available for your congregation. It is especially helpful to compare bills of the previous year for the same month. This comparison helps demonstrate increases in heating and cooling efficiency during the same season in different years.
- 6.** You may want to publish some guidelines or a small diary following what the congregation has been doing for the house of worship in order for them to apply it at home and/or at their workplace.
- 7.** Set a congregation-wide awareness programme. When there is such a programme, it will encourage environmental practices even outside the place of worship
- 8.** Using posters, brochures, newspaper articles, and lectures to explain what is at stake is another thing a place of worship could do to raise awareness among its congregation. Posters and brochures can be easily available from Environmental Agencies, such as WWF, and also from Governmental Environmental Agencies.

◆ ***The following charts can help to identify areas where your building needs enhancements.***



PART THREE:

**PRACTICAL
SOLUTIONS**

The well being of future generations has been a very popular subject since the publication of the Brundtland Report in 1987. The concept extends the principle of equity among the human and natural community along the axis of time. That is why the protection of nature ought to be a priority among the decision-makers in the world. Unfortunately, this is not the case.

Religious communities, because of their nature and because of their presence in every level of the society, can reach many people. They can easily set a behaviour example and spread their influence. For example, it has been known for some time that religious shareholder and/or lobby activists are capable of pushing big companies, and even states, into reconsidering their positions on specific issues.

WHAT CAN BE DONE

A 20 percent reduction of CO₂ could be achieved just by wasting less energy⁵. Experts on Climate Change agree that cost-effective technologies are already available to stabilise emissions of greenhouse gases, but there is also a need to initiate major policy changes to make such a transition. Those experts noted that the past five years have seen big progress in alternate technology to curb greenhouse gas emissions, like wind power and solar cells.

For example, according to the European Insulation Manufacturers Association (EURIMA), every year an amount of roughly 600 million tonnes of CO₂ emissions from energy used to heat both commercial and residential buildings are created in Western Europe only. This amazing amount of CO₂ could be easily reduced by 50 percent thanks to existing technologies⁶, such as utilising compact fluorescent lighting, upgrading space conditioning systems, installing high efficiency appliances and variable speed drive motor systems, using combined heat and power systems for power generation, and using more energy efficient building shell designs.

In some countries the deregulation of the electricity supply industry and the development of renewable energy have already taken place. For the religious communities in those countries there is an historic opportunity to put faith into action by playing an active role in reducing the threat of climate change.

Religious communities, because of their nature and because of their presence in every level of the society, can reach many people. Their example can influence many. For example, it has been known for some time that religious shareholder and/or lobby activisms are capable of pushing big companies, and even states, into reconsidering their positions on specific issues.

This chapter has been divided into two main sections. In the first one describes the areas where an energy saving plan can have its effects:

- Temperature Control.
- Electrical Appliances.
- Lighting.
- Transport.

The second section gives practical suggestions on how to cut energy consumption in the above-mentioned specific areas. The main parts within the second section are the tables in which suggestions are divided in 3 categories:

- How to save energy at zero costs.
- How to save energy at a minimum cost with a quick payback period.
- How to save energy in the long term.

⁵ Dinyar, G., 1999, Gathering Storm, *The New Internationalist*, Vol. 319, December 1999, p. 10.

⁶ Hubert, D. and Hamans, C., 2001, Creating Jobs and avoiding CO₂ Emissions, *Sustainable 2001 Building*, No 01, p. 26.

SPECIFICS ON PRACTICAL SOLUTIONS

➤ **TEMPERATURE CONTROL**

Most of the expenditure in buildings and house holdings is determined by keeping its temperature controlled. According to the European Insulation Manufacturers Association (EURIMA), every year an amount of roughly 600 million tonnes of CO₂ emissions from energy used to heat both commercial and residential buildings are created in Western Europe only⁷.

When starting an energy saving scheme temperature control in buildings is one of the main points to look at. This should be done both in temperate countries and in hot countries as well. In buildings heat is lost from various areas

The amazing amount of CO₂ could be easily reduced by 50 percent thanks to existing technologies, upgrading space conditioning systems, installing high efficiency appliances and variable speed drive motor systems, using combined heat and power systems for power generation, and using more energy efficient building shell designs.

➤ **INSULATION**

Insulation is very important; if a building is not insulated properly, money is wasted in high fuel bills. Buildings can loose heat from different areas, being roofs, walls, windows, doors, and floors.

There are many cost effective ideas, which can help save money and use less energy. As you can see from the tables on pages 24, 26 and 28, several approaches can be taken. Some of them will not cost much, maybe just some time to go through, and some others could be more expensive. The degree of saving depends also on how much you invest in your solutions.

- **Roofs:** As it can be seen in the PRACTICAL SUGGESTIONS section (page 23) roofs are one of the major causes of heat loss. There are many products to insulate properly the roof. Most draught proof materials are cheap and widely available in DIY shops.

- **Walls:** More heat is lost through the walls and they can lose up to 35 per cent of all your lost heat. So, the first thing to do is to check what kind of external walls your building has. In fact, there could be solid walls and cavity walls and they need different approaches.

- **Windows:** Windows should be insulated to avoid draughts. There are different solutions depending on the available budget. If the budget is low, tapes to seal the windows can be bought in DIY shops and can be easily fitted. If the budget allows, one of the technologies now widely available is that of the **superwindows**, which, even on cloudy days, are able to capture solar heat. The clear, colourless windows let in three-quarters of

⁷ Hubert, D. and Hamans, C., 2001, Creating Jobs and avoiding CO₂ Emissions, *Sustainable 2001 Building*, No 01, p. 26.

the visible light and half the total solar energy, but let scarcely any heat escape⁸. They can insulate six times more than normal windows and the more modern versions even twelve times more and they do not allow heating to seep out. Superwindows use invisibly transparent high-tech films to identify visible from infrared (heat) radiation. While the visible light goes through, the infrared is kept outside. They come in thousands of different shapes and each of them is suited to a specific climate, building and direction. Thanks to their characteristics, builders can control the flow of heat and light in and out of the building in each direction. Comfort is improved but also the need for heating and cooling equipment and for energy to run them is reduced. So overall, both construction and operating costs can be easily reduced.

- Doors: Especially the exterior doors are a source of heat loss if they are not insulated properly. You can easily fix strips along the border of your doors if you do not need to change them soon. Letterboxes and keyholes can let in draughts as well. There are solutions like nylon brush seal or a spring flap for the letterboxes and you can put a cover over a keyhole.

- Floors: Again a lot of heat can be lost through floors. If you have wooden boards under your carpet, you can choose between:

1. Filling the gaps between the boards (which can save up to £20 per year on annual fuel bills).
2. Insulating under the boards of the ground floor (that could save around £30 per year) or under the carpets.

➤ HEATING

The only reason for continuous heating is that buildings, be they churches, mosques, synagogues, temples, other houses of worship or schools and hospitals, are continuously losing heat (see above on how to insulate a building). According to the National Energy Foundation over 25% of UK primary energy goes towards heating buildings, more than for any other purpose⁹.

- New windows, especially superwindows (see above) and double glazed windows can reduce the lost heat considerably.

- In Germany, some houses have been fitted with a system to warm air before it gets in the building. Because the temperature of the ground is always warmer than the outside temperature the fresh air is flowed first through a plastic pipe buried 3-4 metres underground. The air which is then circulated in the building needs less energy to be warmed up. Moreover, the airflow can be separately controlled to different parts of the building, and the more people there are in a given part, the more fresh air they will get because, as they breathe, a sensor detects the resulting carbon dioxide and adjusts the quiet ventilation fan accordingly.¹⁰

- The presence of simple timeswitches or programmers, room thermostats, thermostatic radiator valves help to improve the control the temperature of a building and consequently the use of energy.

⁸ Von Weizsäcker, E., Lovins, A.B., and Lovins, H.L., 1999, *Factor Four, Doubling Wealth, Halving Resource Use*, Earthscan Publications Ltd, London, UK, p. 19.

⁹ More information can be found in <http://www.natenergy.org.uk/passol.html>

¹⁰ Von Weizsäcker, E., Lovins, A.B., and Lovins, H.L., 1999, *op. cit.*, p. 15.

- Your choice of heating can improve your efficiency as well. In fact, there are different systems to warm a building and the choice depends on the shape and size of it. You can choose between a variety of heating systems according to your needs. For example, Infra-red and fan heaters are ideal for when an area is only used occasionally. Fan heaters are cheap to install, from about £10 per kW, they are more effective in areas that are not too draughty.

- Go solar. Solar water heating, for example, involves the capture of the sun's energy to heat water. The heat, which is collected by solar panels, is commonly used for domestic hot water. According to the National Energy Foundation (UK), savings in running costs of domestic hot water can be of 40% to 50% in energy bills. In the summer, the panels may provide all the hot water needs, and the saving in winter while they may be lower can still be significant. Energy is captured even on overcast days.

➤ COOLING AND AIR CONDITIONING

In many countries, especially in hot countries, air conditioning is spreading enormously. Yet in some countries a tradition of ingeniously designed shelters to reject the heat still exists. Windowless 11th and 12th century *Anasazi pueblos* in the American Southwest kept temperatures, in their buildings, enjoyable both in summer and winter. Rooms were best able to take advantage of the passive solar properties. The *Anasazi* designed their buildings to collect solar heat from the beginning to the end of each winter day. In summer, the solar system could have been used in reverse, with people following shaded areas from the east wing in the morning to the west wing in the afternoon¹¹.

The famous Palace of Winds in Jaipur, India, used an intricate system of corridors and windows to keep the temperature inside the palace pleasant and enjoyable for the ladies who would spend most of their time in it.

On the north coast of Australia, traditional tropical house designs can maintain indoor temperatures as much as 19 degrees cooler than outdoors.

Nowadays, new technologies can reach those results as well. They may be more expensive, to install than conventional systems, but the more energy efficient technologies lower the ongoing costs required to operate a building at a comfortable temperature through its life.

- In new construction, good architecture is vital. Making buildings the right shape and pointing them in the right direction can often save a third of their energy without extra costs.

- In California a company has developed a *WhiteCap*. It consists of a shallow pond on the roof beneath squares of white foam insulation. During the day the building transfers its heat to the water. At night the process is reversed, the water is sprinkle into the air to cool it down and it percolates through the foam back into the pond. The energy used to pump the water out is only a few percent of the cooling energy saved.

¹¹ Burley, J.B., *Anasazi Site Planning: Historic Precedents, Modern Constructs, and Multi-cultural Dynamics*, available at <http://www.ssc.msu.edu/~laej/historypapers/Burley3/Burley3text.html>. [Accessed 15 March 2001].

➤ **ELECTRICAL APPLIANCES**

About 30-50 percent of the energy used in most industrialised countries runs appliances. So a careful and detailed analysis of what electrical appliance is bought can make a real difference.

- In Europe the European Union has designed a label, which shows the energy efficiency of appliances compared to similar models. "A" energy rated appliances are the most efficient and "G" the least efficient. The label also shows the electricity consumption of the appliance in units (kWh) under standard test conditions. As well as giving information on the efficiency of an item, the rating allows the European Union to remove the least efficient models from sale. This curbs running costs for consumers and reduces CO₂ emissions. By law, the energy label must be shown on all fridges, freezers, and fridge freezers, washing machine, tumble dryers, washer dryers and dishwashers.
- Office equipment, such as computers, fax machines and photocopy machines, are not included in the label scheme. However, there are now some kinds of computer chips and power supplies that use far less energy than others. In the Us the *Energy Star* sign is an efficient rating system applied to computers, printers, modems, scanners and monitors. This system shows the electricity consumption of the products and it is also available on goods sold in the UK.
- According to Canadian research, another problem with computers, copy machines and televisions is that they are not actually being used for about 90 percent of the time they are on¹². They therefore recommend devices and software that can put machines, especially computers, into a sort of sleep until they are needed again.
- Laptops are more energy efficient than desktops and they save materials and costs to start with.
- An ink-jet printer uses only 1 or 2 percent as much electricity as its laser equivalent. Laser printers take many hundreds of watts to heat their drums and, moreover, they heat their environment as well.

➤ **LIGHTING**

In the US, lighting counts for one-fifth of all electricity used and half of the lighting energy is used by ordinary incandescent light bulbs¹³. In the UK, lighting is responsible for 16 per cent of domestic electricity use. To households this costs an astonishing £1.2 billion on electricity bills every year¹⁴.

There are a few simple improvements, which can be done with a low budget; this initial process can help changing the situation.

- Compact fluorescent light bulbs use 70 per cent less electricity than traditional incandescent or halogen lights and last ten times longer.

¹² Von Weizsäcker, E., Lovins, A.B., and Lovins, H.L., 1999, *op. cit.*, p. 42. (Factor 4)

¹³ Von Weizsäcker, E., Lovins, A.B., and Lovins, H.L., 1999, *Factor Four, Doubling Wealth, Halving Resource Use*, Earthscan Publications Ltd, London, UK, p. 37.

¹⁴ Go Mad, 365 Ways to Save the Planet, 2001, Edited by The Ecologist, Think Publishing, London, UK, p. 92.

- A recent study by the US Department of Energy's Lawrence Berkeley National Laboratory, has announced the development of a fluorescent table lamp that reduces the need for overhead lighting. The laboratory says the lamp matches the combined output of a 300-watt halogen lamp and a 150-watt bulb, but uses a quarter of the energy¹⁵. The same study states that other technologies have been proved in field tests. At Fort Polk, an Army base in Louisiana, U.S., electricity use during peak hours fell by 43 percent after base managers installed fluorescent lights, low-flow shower heads, new attic insulation and new home heating and cooling systems.

- Other very large and even cheaper savings can be achievable by how the light is used. Make the most of daylight by painting your walls with light colours, and laying light carpets. This will also help unnatural light bounce around the room better.

➤ **TRANSPORT**

In many parts of the world believers go to churches, mosques, synagogues, temples and other houses of worship by car. Around the very *lieu* of worship real parking areas can be found. Cars are responsible for a huge share of CO₂ emissions. Every year there are more cars on the roads. Churches, mosques, synagogues, temples and other houses of worship can become the central place to raise awareness about public transport or/and alternative transport. Car sharing can be one of the option to consider.

Faiths can use their influence among their congregations to promote the use of public transport. As more and more people use their cars to go to places of worship the air near them becomes more polluted. Modern cars have catalytic converters which can destroy most of the pollutants, but they only work well when the car engine is hot, and this can take longer than the duration of a local trip.

- Cars are becoming more efficient, in fact from 1973 to 1986, the average new US-made car became twice as efficient, the consumption has gone down from 17.8 to 8.71 l/100¹⁶. Electrical cars have already appeared on the market and they are widely available. These small cars are the best choice for the urban traffic and many countries are exploring electrical bus fleets.

- It is now possible to achieve increased efficiency of hybrid engine cars, and use devices and energy conversion technology, which can go a long way in stabilising atmospheric greenhouse gas concentrations at a safer level. Hybrid engine cars have engines that can operate on both electricity and gasoline. These automobiles do not need to be "plugged in" to recharge batteries as is the case for electric cars. The hybrid engine recharges its electric battery through the car's braking action. Given this unusual technology, available today from Toyota and Honda, the cars

¹⁵ Kahn, J., 2001, U.S. Scientists See Big Power Savings From Conservation, *The New York Times*, 05 May 2001.

¹⁶ Von Weizsäcker, E., Lovins, A.B., and Lovins, H.L., 1999, *Fattore 4*, Edizioni Ambiente, Milano, Italy, p. 3.

obtain higher fuel economy (more miles per gallon) in the city than on the highway. Toyota's four-door Prius sedan can get 52 miles per gallon in the city and 45 miles per gallon on the highway.

● Religious lobby, has convinced Ford Motor Company to announce that they would voluntarily build its sport utilities (S.U.V. which constitute for one fifth of their profit) to emit far less tailpipe pollution than allowed by law in the US¹⁷.

¹⁷ Bradsher, K., 2000, Ford Is Conceding S.U.V. Drawbacks, But Environmental and Safety Concerns Won't Stop Sales, *The New York Times*, 12 May 2000.

PRACTICAL SUGGESTIONS

➤ **HOW TO REDUCE YOUR PERSONAL ENERGY CONSUMPTION**

A common belief is that people produce CO₂ only when using their cars. As seen, this is not the real picture. In fact, the average home emits more carbon dioxide than the average car as most the electricity used in a house is generated by burning fossil fuels like coal, oil, and natural gas.

Churches, mosques, synagogues, temples and other houses of worship, which are taking steps to monitor and reduce energy and water consumption, to use resources efficiently and to reduce waste, find that these measures pay for themselves through cost savings.

Even small contributions can make a difference and everybody should be urged to make them. A few tips for saving energy can be found in this section. Some of the improvements cost close to nothing, but they involve a more conscious approach and a personal contribution. Others may involve some costs. However, starting with a zero-cost solution can save money from the beginning, reduce to operate a building throughout its useful life, and those cost savings can be reinvested in a longer-term plan to further reduce energy use.

An energy saving programme is more than a scheme to save money. It is a declaration of respect towards our biosphere, the creation and, above all, it underlines that we recognise that Nature has a right to exist.

➤ **HOW TO SAVE ENERGY AT ZERO COST**

Temperature Control

- Turn down the heating. A reduction of one degree Celsius in temperature can reduce your costs by up to 10%.
 - Fit shelves above radiators. Shelves help to deflect warm air into the room.
 - Ensure there is free space around radiators and hot air grilles. This ensures that hot air circulate freely.
 - Buy radiator insulator panels (non PVC ones are available) to be fitted between radiators and the wall (No need to remove radiator).
 - If you have electric fires and fan heaters in place, consider using more energy-efficient forms of heating.
 - Make sure thermostats read the actual temperature.
 - Make sure heating equipment switch is on and off at appropriate times.
 - Water should not be heated to more that 60° C/140° F.
- Close windows and doors.
- Check time switches to ensure that they are showing the correct time and are set for Summer Time.

Electrical Appliances

- Switch off TVs at source and other electrical appliances when not in use:
 - Standby electrical appliances. Typically, the standby facility uses 25% of the machines' daily consumption. A PC monitor left switched on overnight wastes enough energy to laser print 800 A4 sheets of paper.
 - Screensavers do not save energy and sometimes they use more energy than when the computer is used.
 - Sockets sometimes use up electricity up even if an electrical appliance is off. If there is a way to switch the plug off do it, otherwise unplug the plug.
- If in your premises you have washing machines available:
 - Use a washing machine when there is a full load. If this is not possible, use the economy or half-load programme.
 - Avoid washing at more than 50°. Washing garments at 40° instead can cut the energy used during the lifecycle of clothes and material by 10 per cent.
- If in your premises you have fridges available:
 - Make sure your fridge is situated far from hot sources (i.e. cooker).
 - To keep the coils at the back of your fridge clean avoids energy consumption increase.
 - Do not put cooked food that is still warm into your fridge.

Lighting

- Turn the lights off in unoccupied rooms, and ask visitor and staff to do the same.
- Make the most of natural light:
 - [Withdrawing the curtains during daytime.](#)
 - [Keeping your windows clean.](#)
 - [Painting your walls in light colours.](#)
 - [Laying light coloured carpets.](#)

Transport

- Display local public transport information on a notice board.
- Organise car-free days.
- Organise cycle outings after functions to encourage use of bicycles.
- Promote car share.
- Organise and co-ordinate the use of car-pools.
- Under-inflated tyres means more work for the engine and more consumption of fuel. Keep your tyres in good condition by pumping them regularly.

➤ **HOW TO SAVE ENERGY AT A MINIMUM COST WITH A QUICK PAYBACK PERIOD**

Temperature Control

- Keep energy use controlled.
 - [Install Timeswitch or programmer](#)
 - [Install room thermostat \(should be fixed on the walls in the most frequently used rooms\).](#)
 - [Install Thermostatic Radiator Valves \(TRV\).](#)

- Increase loft insulation to a minimum depth of 150mm and ensure all pipes are insulated. According to a study by the Energy Saving Trust (UK), installing loft insulation to a depth of at least 200mm (8") saves 20 percent of heating costs.
 - [Insulate the water tank and pipes. That makes an enormous difference to the energy loss.](#)

- Improve draught insulation
 - [Where it is possible, double-glaze windows \(double glazing conserves energy but can be very expensive to install unless windows need replacing anyway\).](#)
 - [Draught strips and seals: fitting them is inexpensive.](#)
 - [Where it is possible, fit curtains thermally lined and fireproofed. They should be closed during winter nights.](#)
 - [Close the windows when rooms are empty.](#)
 - [Carpeted floors: on solid floors carpets reduce heat loss to the ground; on wooden floors, they prevent draughts.](#)
 - [Where it is possible, fit "double doors" or "draught lobbies". These provide added safety as well as preventing draughts.](#)

Electrical Appliances

- When buying new appliances, chose the most energy-efficient models.
 - [For information about Eco-label, A-E-scheme see Part Three, Specific on Practical Solutions, page 22.](#)
 - [When buying a computer, printer, modem, scanner or monitor look for *Energy Star* sign. The *Energy Star* is a US rating system, but it also applies for goods sold in the UK.](#)

Lighting

- Install energy-saving bulbs, like compact fluorescent light bulbs.
- Switch to supply companies which get their electricity from renewable sources.

Transport

- Print small leaflet with information about public transport to and from your place of worship.
- Fit a fuel saver device into the fuel line of your communal car engine. It will reduce emission of gases by 40 per cent, and it will also save 10 per cent on your fuel costs.

➤ **HOW TO SAVE ENERGY IN THE LONG TERM**

To evaluate how you can have the greatest impact on your energy consumption over a longer-term, you should undertake an energy audit. This establishes base information about where you are now and enables you to plan an energy conservation programme and quantify the costs and returns on longer term capital investment on energy-conserving measures.

An energy audit would ascertain:

- How much energy you currently use.
- Where it is used (Temperature Control, Electrical Appliances, Lighting, Transport)
- How much it costs (invoices from the supply companies, see Charts pages 20 and 21).
- Where there is scope for savings (inefficiency in the system).

Examples of actions that may be recommended by an energy audit include:

- Better insulation of external windows, walls, roofs, floors, and pipe work.
- Better controls of lighting and heating
- Better energy-saving devices such as light bulb.
- The installation of heat recovery devices in ventilation systems.

A church, a mosque, a synagogue, a temple or another house of worship can choose also to go for an alternative way of getting energy. The green energy market is booming everywhere and, now, in some countries it is possible to choose one's own supplier. In the USA, for example, religious groups have founded the Episcopal Power and Light (EP&L)¹⁸ ministry with the support of the Regeneration Project, a San Francisco based public charity in the Tides Center. Their mission is to help, at no cost, individuals and institutions of the Episcopal Church to further their stewardship of Creation.

Green electricity can be created by tapping the wind. In several European countries and regions wind power counts for from 8 per cent (Denmark) to 20 per cent (Navarra-Spain) of national electricity consumption¹⁹.

Buildings, if they have enough resources, can implement a small wind farm to produce their own energy. In fact, wind power is becoming one of the cheapest sources of electricity. The cost of wind electric generation has dropped from \$2,600 per Kilowatt in 1981 to \$800 in 1998 and it is still dropping²⁰.

¹⁸ More information about that page 5.

¹⁹ Brown, L.R., 2000, Saving the Planet, No Time to Lose, *The Hindu, Survey of the Environment 2000*, p. 13.

²⁰ *Ibid.*, Brown, L.R., 2000, p.13.

➤ **HOW TO REDUCE YOUR PERSONAL WASTE**

Methane is the second most important green house gas and, consequently, it is responsible for global warming. Methane is naturally occurring, but human-related activities such as fossil fuel production, animal husbandry (digestive processes of ruminant livestock and manure), rice cultivation, biomass burning and waste management release significant quantities of methane into the atmosphere. Landfills, coal mining, livestock, manure and the production and transmission of natural gas are among the major sources of human-produced methane.

In 1990, in the UK, emissions of methane from landfill represented 33% of anthropogenic methane emissions. In 1998 that percentage had raised to 40%²¹.

The best way of dealing with waste, and with the methane it produces, is not to create it in the first place. Avoid the unnecessary creation of waste (e.g. ask suppliers to reduce packaging where practicable).

Identify wastes that can be re-used and try to put materials back into the production cycle (e.g. ask supplier to take back containers for refilling).

➤ **HOW MUCH WASTE DO WE PRODUCE**

You can survey the amount of waste a building produces. Surveys can be designed to suit all abilities and ages.

- To raise awareness at a local level “Collect-the-Litter-Days” can be organised. People, with adequate protective gloves, could clean an area, a park, a beach, a road or a surrounding area.

²¹ For more information about methane concentration in the UK, please consult <http://www.defra.gov.uk/>

➤ **THE THREE R'S: REDUCE, RECYCLE, REUSE**

➤ **REDUCE**

Investigate what products you use in your building and check whether it is possible to avoid some of them or buy others with less packaging.

- Environmentally-friendly purchasing does exist. So you may want to have, first, a **Purchasing Policy** in place.
- Make a list of everything you buy and consider each one in turn against the waste hierarchy. Especially those near the bottom should be targeted for a better alternative.
- Try to avoid over packaged items which give you two problems, you are paying to buy them and to get rid of them.
- Buy nonaerosol (which can be refilled) cleaning materials and milder alternatives. Ensure all are phosphate free.
- Buy unbleached, chlorine-free or recycled stationery or paper products.
- Buy natural air fresheners (pot-pourri) which are as good as aerosol and less damaging.

➤ **RECYCLE**

You can start with glass, tins and paper. Provide separate bins or boxes where to collect different material.

- There are several companies that can be contacted to collect your recycled materials for free. (maybe lists of companies can be found in town halls, yellow pages, business directories, groundwork and business in the community).
- Recycling one glass bottle saves enough energy to power a 100 watt fluorescent light for a 40-hour week; and recycling one ton of glass substitute 1.2 tonne of raw material and allows a saving of 100 kilos of oil²². Recycling 10 aluminium cans saves enough energy to power your TV set for a week.

²² Salari, G., 2001, Che fine ha fatto il vetro, *Mondus Vivendi*, No 18, January 2001, p. 08.

➤ **REUSE**

Some of the things you use can be easily re-used for other purposes, if your local refuse collection service does not cater for separated refuse (many don't).

- Organic waste can be used as compost to fertilise lawns, flowerbeds and so on around the building.
- Local community textiles can be collected and sent to The Salvation Army Clothing Bank Scheme, for example, or passed onto other people at the local community level.



PART FOUR: CONCLUSION AND APPENDICES

CONCLUSION:

Let's preserve it

In a culture dominated by the bare logic of market exchange, everything becomes commodified, including creation. Conscious citizens of this world should refuse to be sucked into this system. The values of the creation and people's beliefs should not be measured in dollars and should always be taken into consideration.

The global market has been criticised for turning parts of the global commons into saleable pieces of property, e.g. commodities. Such a conception clearly contradicts ethical beliefs that see the atmosphere as common heritage of all the Earth's bio-community, or as God's creation.

From an economic point of view, the natural world has always been considered as a mine from which to find resources, which are only then given value. So Nature provides resources, sites and sinks for industrial activity, which produces valuable goods and services for consumers. However, the depletion of sources, the degradation of sites and the overflow of sinks has not been accounted for in the profit and loss calculations. Unfortunately Nature and its services have always been regarded as free and, potentially, infinite. But, nature is already showing signs of distress, through natural disasters which have hit many countries recently. Recent concern about the melting of glaciers and Arctic ice has hit the news²³. Reports from very well known institutions and scientists say that the average temperature of the earth has been rising constantly and from 1866 it has increased of 0.6° C²⁴.

Very often transnational corporations may be more responsible for emissions than states. After all, of the 100 largest economies in the world today, 51 are corporations and only 49 are countries. The real challenge of sustainability is addressed at the existential and spiritual level, and it is here that faith groups can be very influential.

The present incentive system, which subsidises fossil fuels, encourages resource-intensive production and consumption patterns that lead to increased greenhouse gas emissions from all sectors. Faith groups can mobilise support among key sections of society by exerting pressure on governments, industries and the market itself with their purchasing power and by encouraging people to accept personal responsibility in the face of the enormous problem of global warming.

Everybody can share in this responsibility. Churches, mosques, synagogues, temples and other houses of worship are small centres from where to spread the word. Community members can apply the principles they learn and can spread them to a wider audience through their jobs, hobbies, interests, and so on. They and their relatives can influence the way companies operate and this creates a wave of innovation. They/we can bring the concept of sustainability

²³ Arctic ice thickness has declined by 42 percent since the 1950s. In Brown, L.R., 2001, *State of the World 2001*, Earthscan Publications Ltd, London, p. 87.

²⁴ Brown, L.R., 2001, *op. cit.*, p. 86.

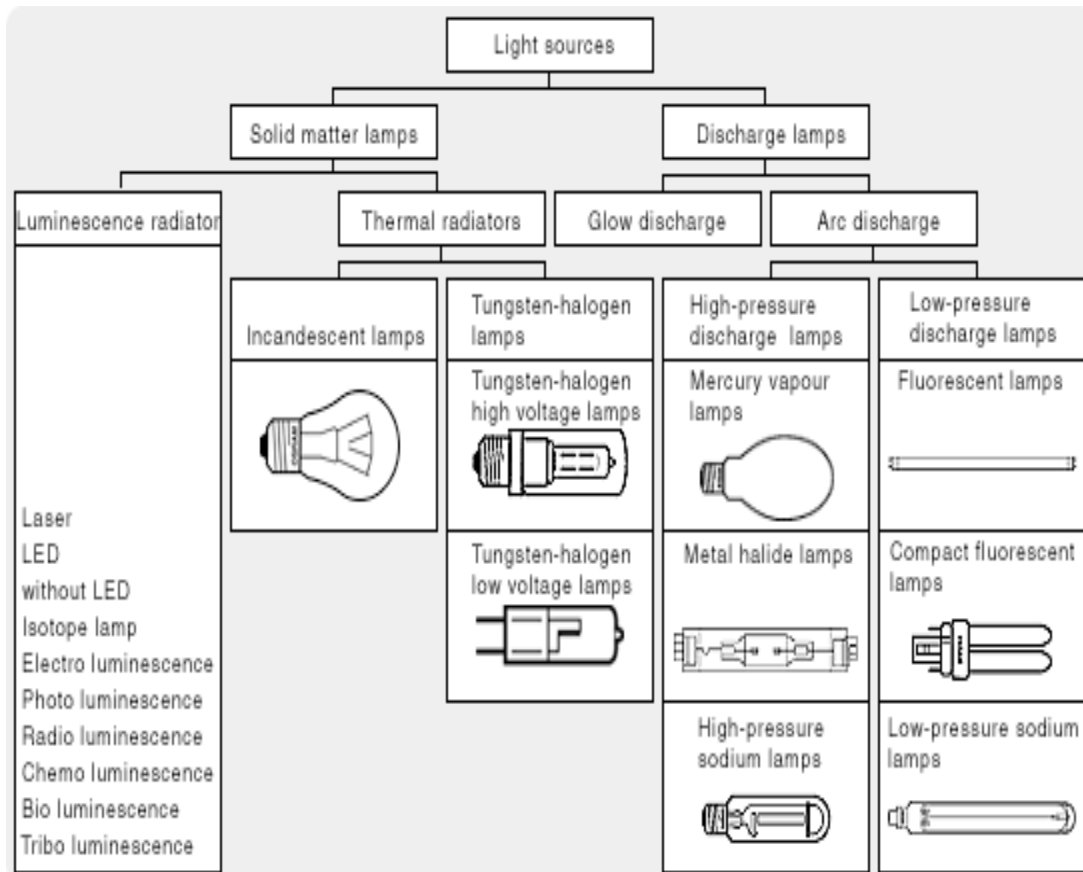
to the boardroom agenda and into management practices in order to change accepted patterns. Everybody can influence the way business works and everybody can contribute to a better world.

In response to the enormous problem of global warming, religious communities can encourage individuals to accept responsibility. They can mobilise support among key sections of society, by exerting pressure of industries and market-places with their purchasing power, and ultimately they can influence government itself.

It is undoubtedly humanity that holds the biosphere in trust; all citizens equally share in the trusteeship of a common inheritance. Let's preserve it.

APPENDIX 1: LIGHTBULB INFORMATION

The world of lamps can be divided into thermal radiators and luminescence radiators.



Source: Osram

Light Source	Luminous Efficiency* (lm/kW)	Life (h)
Incandescent lamp	14	1000
Tungsten-halogen lamp	20	2000
Compact fluorescent lamp	87	12000
Fluorescent lamp	104	12000

*Luminous Efficiency indicates the efficiency with which the electrical power consumed is converted into light. The maximum that can be achieved, in theory, with all the energy being converted into visible light is 683 lm/kW. In reality, the figures are much lower, between 10 and 150 lm/kW.

Source: <http://www.osram.com>

APPENDIX 2: SUGGESTED BIBLIOGRAPHY

ANON, 2000, Harvest rainwater, SC orders DJB, *The Hindustan Times*, 11 May 2000.

ANON, *What is Climate Change?*, available at <http://www.ec.gc.ca/climate/whatis/index.html>, [accessed 06 June 2001].

BRADSHER, K., 2000, Ford Is Conceding S.U.V. Drawbacks, But Environmental and Safety Concerns Won't Stop Sales, *The New York Times*, 12 May 2000.

BROWN, L.R., 2000, *Saving the Planet, No Time to Lose*, in *The Hindu, Survey of the Environment 2000*, pp. 7-14.

BROWN, L.R., 2001, *State of the World 2001*, Earthscan Publications Ltd, London, UK.

BRYAN, B. J., *Anasazi Site Planning: Historic Precedents, Modern Constructs, and Multi-cultural Dynamics*, available at: <http://www.ssc.msu.edu/~laej/historypapers/Burley3/Burley3text.html>. [Accessed 15 March 2001].

DINVAR, G., 1999, Gathering Storm, *The New Internationalist*, **Vol. 319**, December 1999, pp. 9-11.

HUBERT, D. and HAMANS, C., 2001, Creating Jobs and avoiding CO₂ Emissions, *Sustainable 2001 Building*, **No 01**, pp. 25-26.

KAHN, J., 2001, U.S. Scientists See Big Power Savings From Conservation, *The New Your Times*, 05 May 2001.

SALARI, G., 2001, Che fine ha fatto il vetro, *Mondus Vivendi*, **No 18**, January 2001, pp. 8-9.

VAN HAL, A. and RONALD, R., 2001, Inspiring Continents at SB2000, *Sustainable 2001 Building*, **No. 01**, p. 9.

VON WEIZSÄCKEER, E., LOVINS, B.A., and LOVINS, H.L., 1999, *Factor Four, Doubling Wealth, Halving Resource Use*, Earthscan Publications Ltd, London, UK.

APPENDIX 3: INTERNET ADDRESSES

Climate Care

<http://www.co2.org/>

http://www.ci.austin.tx.us/news/harvest_tours.htm

<http://www.sherwoodenergyvillage.co.uk>

Energy Saving Trust

<http://www.est.org.uk>

Energy Efficiency and Renewable Energy Network

<http://www.eren.doe.gov/>

Energy Efficiency Conservation Authority, New Zealand

<http://www.etsu.com/>

Office of Energy Efficiency

<http://oee.nrcan.gc.ca/>

World Energy Efficiency Association

<http://www.weea.org/>

NorthWest Energy Efficiency Alliance

<http://www.nwalliance.org/resources/EnCrnch.html>

Electrical Energy Efficiency

<http://energy.CoPper.org/>

Consortium for Energy Efficiency

<http://www.ceefornt.org/>

Osram

<http://www.osram.com/>

<http://www.safeclimate.net/calculator/>

http://www.pacinst.org/cc_6.html

Department of Environment, Food and Rural Affairs

<http://www.defra.gov.uk/>

APPENDIX 4: STATEMENT OF COMMITMENT

Climate Change Initiative

We the undersigned agree within our own congregation to investigate what our impact is on the Creation and how we can reduce it starting by curbing our CO₂ emissions. We offer this as gift to the Creation and to its inhabitants and as a sign of our heartfelt concern. We also offer thoughts, prayers and readings from our different traditions for this is an issue which touches us at the deepest levels and is not just a matter of economics, politics, or science. It is all this and more.

Signed:	Date:
Name (print clearly):	Position
Organisation/group:	Main Faith (eg. Buddhist, Christian, Islam.....):
Your contact details:	

Please add any prayers, readings or reflections which you feel would be helpful to this initiative.

Please send a signed paper Copy of this Document to reach us at ARC by fax or post.

ARC, 3 Wynnstay Grove, Fallowfield, Manchester M14 6XG, the UK.

Fax +44 (0)161 248 5736

E-mail: paola@icorec.nwnet.co.uk

Alliance of Religions and Conservation

3 Wynnstay Grove,

Fallowfield,

Manchester M14 6XG,

United Kingdom

Tel: 44 (0)+ 161 248 5731

Fax: 44 (0)+ 161 248 5736

E-mail: arc@icorec.nwnet.co.uk

Website: www.religionsandconservation.org