

SMART HOMES IN EUROPE

Estonia Greece Iceland Italy Norway Poland



CONTENTS

3 INTRODUCTION

4 ESTONIA

13 GREECE

26 ICELAND

31 ITALY

42 NORWAY

50 POLAND

60 CONCLUSION



INTRODUCTION



This catalogue is the final work of our multilateral Comenius project entitled 'SMART homes in Europe'.

Six countries, Estonia, Greece, Iceland, Italy, Norway and Poland, have been working during the two years 2010/2012, after a contact seminar in Madrid where the participants met.

Science, Maths, Art are the subjects that pupils of each school particularly studied and researched in order to create the idea of a green house in every country. All the houses together constitute a European village in every country partner keeping

in mind the aim of taking care of environment, saving energy, create new energy sources. At the end of our shared adventure we say many thanks to the headteacher of the school Vatnsendaskoli of Iceland responsible of cooperation among the countries of the group and the headteachers of all the other countries schools Pelgulinna Gymnasium (EE), 2nd Primary school of Vrontados 'Panagia Erithiani' (EL), IC Via Latina, 303 (IT), Vingrom skole (NO), Szkola Podstawowa Nr 3 im. Janusza Korczaka (PL), that made possible to work with the classes of their schools and hosted the guests during the meetings every time in a very warm and friendly atmosphere.

Lucky to have had the opportunity of working together there will be the basis of future cooperation and friendship.

Enjoy the reading

ESTONIA



ESTONIAN GREEN HOUSE



DESIGN

- ☺ 2 Floors
- ☺ Lime plaster on the walls
- ☺ Solar panels on the roof
- ☺ Design elements on the walls



- ☺ Wooden furniture
- ☺ Solar energy powered lamps
- ☺ Casein paint walls
- ☺ Compact
- ☺ Drawings on walls

MATERIALS

- ☺ Wood
- ☺ Thatch mats (insulation)
- ☺ Thick glass
- ☺ Solar Panels



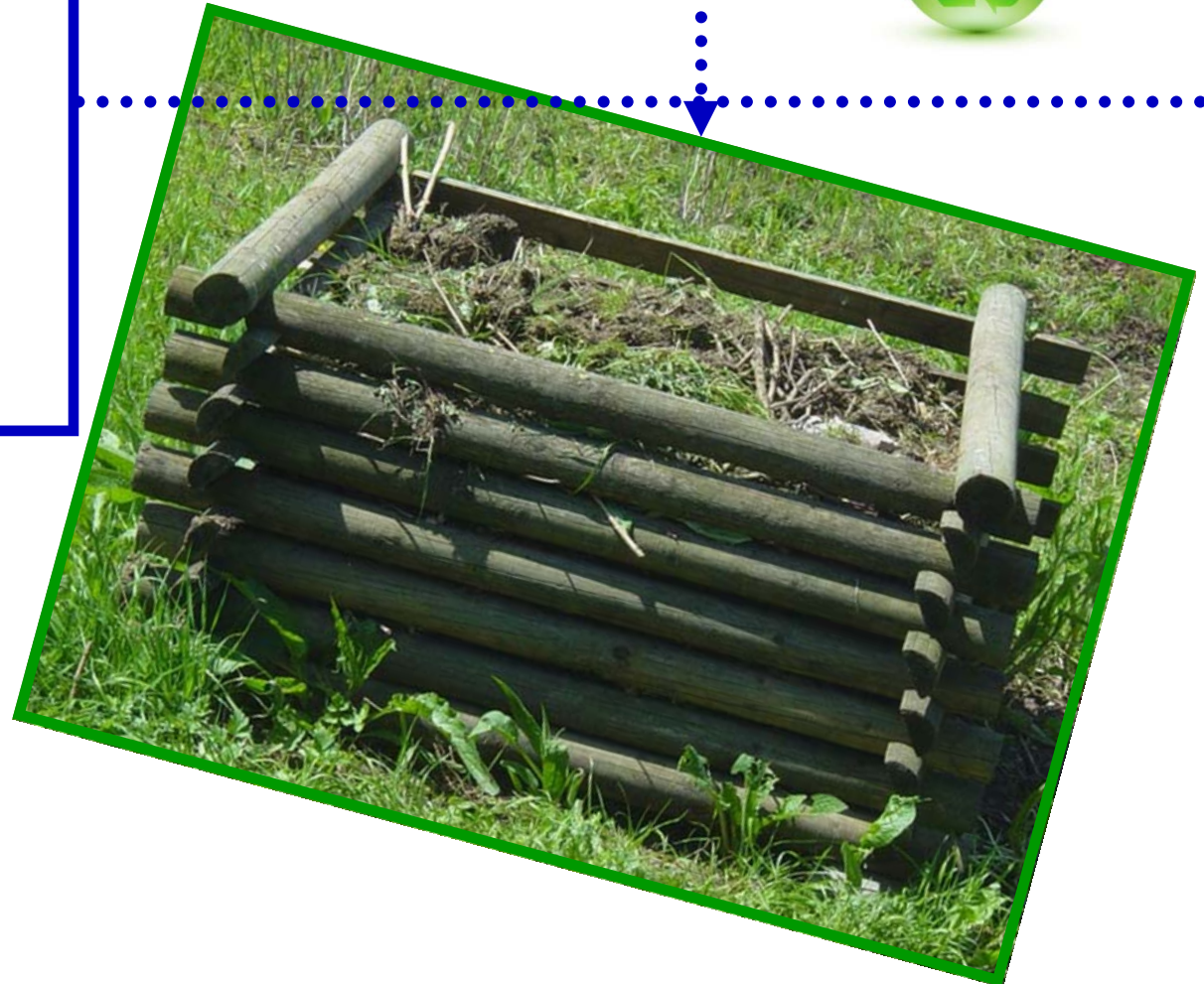
SAVING ENERGY

- ☺ Solar energy (panels)
- ☺ Lamps that automatically turn off
- ☺ Heat exchange ventilation system
- ☺ Fireplace

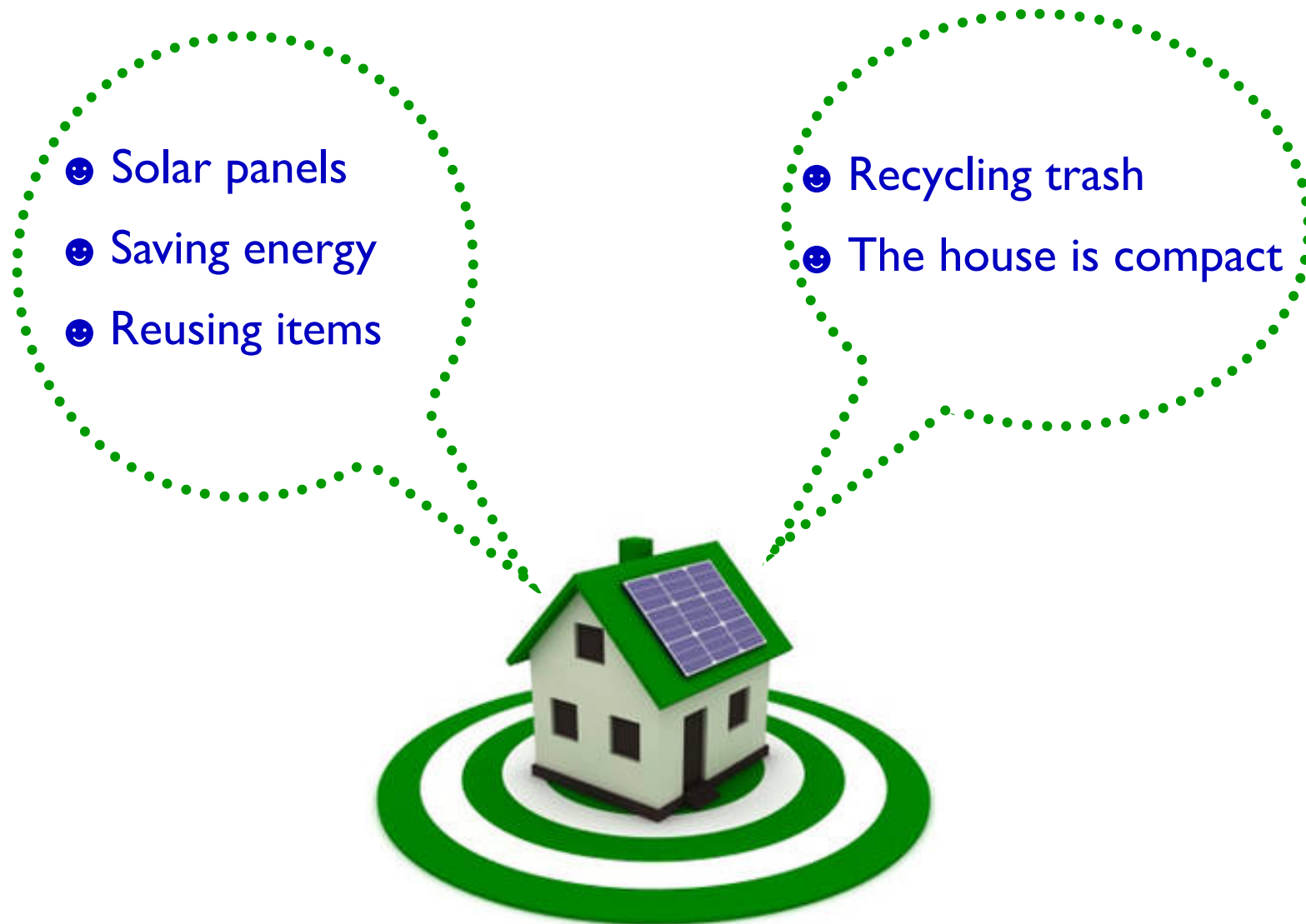


RECYCLING

- ☺ Scrap paper (can be burned for warmth, can be used to make paper)
- ☺ Recycling trash
- ☺ Recycling bottles and cans
- ☺ Water used in sinks reused for toilets
- ☺ Compost



WHAT MAKES THE HOUSE „GREEN“



THE CONSTRUCTION OF OUR HOUSE



WORK
IN
PROGRESS



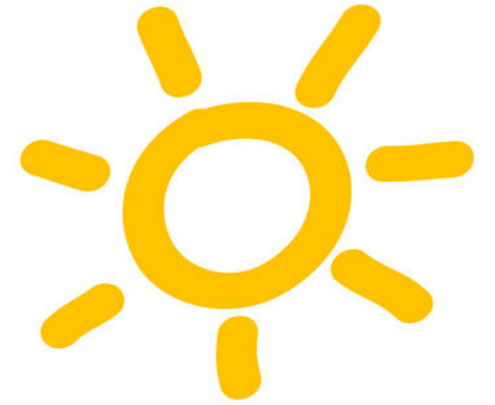
THE CONSTRUCTION OF OUR HOUSE



WORK
IN
PROGRESS



GREECE



GREEN HOUSE OF CHIOS



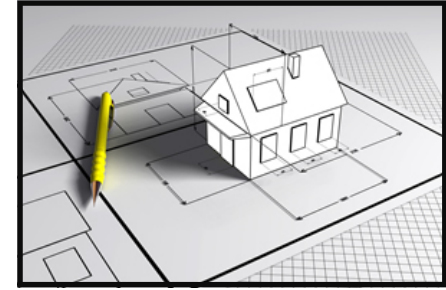
Made by the 2nd Primary School of Vrontados,
Panagias Erithanis

Responsible teachers: Manolis Axiotis & Despoina Avramidou
Technical responsible: Anthimos

Participants: The children of the 6th, 5th, 4th and 3rd class of our school

Assistant on photography and text writing: Maria and Vanessa from Germany,
Miriam from Austria and Anna from Poland

DESIGN



Our “Green House” is divided into seven parts; there are three bedrooms next to each other, which are connected through a hallway to the other parts of the house. The living room is connected to the kitchen by an arc entrance. The bathroom is situated at the end of the hallway, oppositely from the main entrance of the house, to which a veranda with a staircase is leading. The house’s design is structured like typical houses in Chios are built, especially in the region of Vrontados.

DESIGN

To take advantage of the sun's movement and the wind directions, the rooms are placed at specific locations in the house. So, the kitchen, the dining area and the living room are in the **south** part and the bedrooms are in the **northern** side. This way, especially in the summer time the bedrooms are cooled by the natural influence of the wind, which comes mostly from the north.

The bathroom is located in the west part of the building, so the backside of the house.

As the wind on the island is very strong, the houses have the shape of a square, so that they are stable and they can stand the strong weather.



MATERIALS



We used materials, that we found in nature or reused old things as materials to build this house.

For the walls we used hard paper, polystyrene and cork which represent the isolated stone walls.

Also the roof, the floor, the path around the house and the furniture were made from this material. Different wrapping papers were used as wallpaper and for the floor.

Balsa wood was used for the windows, doors and the floor.

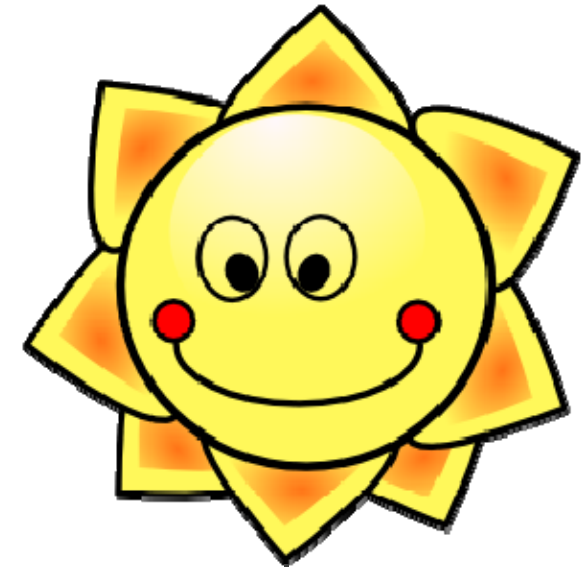
To symbolize the grass on the roof and outside the house, we chose artificial grass and the trees were made from branches.

We took special powder made from cement and sand that you have to mix with paint that protects the house from weather influences.

The solar panel on the roof is real and gives electricity to the lamps.



SAVING ENERGY



We used solar energy in the house for electricity and for the water heating. This solar energy is taken from the solar panel located on the roof of the house.

SAVING ENERGY



The fire place in the living room can also be used to heat the water.

The grass situated on the top of the house makes the house cooler in the summer.

SAVING ENERGY



The rain water from the roof, which is collected in the water tank, can be used for living and for the garden.



The walls are isolated with Styrofoam and cork, and the windows have double glass, which keep the temperature inside the house.

RECYCLING



The “Green House” recycles to make use of used materials, to prevent the wastage of useful materials, to reduce energy usage, to reduce air and water pollution.

So, to reduce the usage of electric energy, the house uses the photovoltaic panel to generate solar energy which can be used for heating water, as well as for the usage of electric instruments.

With the aim to reduce the wastage of natural resources, during the rainy season in the winter the rain water from the roof is collected in a water tank. This water can be used for in the summer for e.g. watering the garden.

Moreover, the well in front of the house is collecting groundwater which can be used effectively in and outside of the house.

To make use of waste material, loose woods are collected and dried for firing the fire place during the winter time.

Also, to make it easier for the public recycling system, the house’s garbage is divided into paper, plastic and organic waste.

WHAT MAKES THE HOUSE „GREEN“



The aspects which make our house a “Green House” are mentioned in the previous two chapters. As the house is making use of the recycling process and it is saving energy, it is environmentally friendly and it is focussing on the technologies of renewable resources.

Especially this traditionally designed Chian house makes use of the certain natural influences of the island (strong wind in the winter; hot sunshine in the summer).



THE CONSTRUCTION OF OUR HOUSE



Preparing the walls, cutting windows into the styropor

THE CONSTRUCTION OF OUR HOUSE



Putting the
parts of the
house together



THE CONSTRUCTION OF OUR HOUSE



The finished structure of the house and its surface

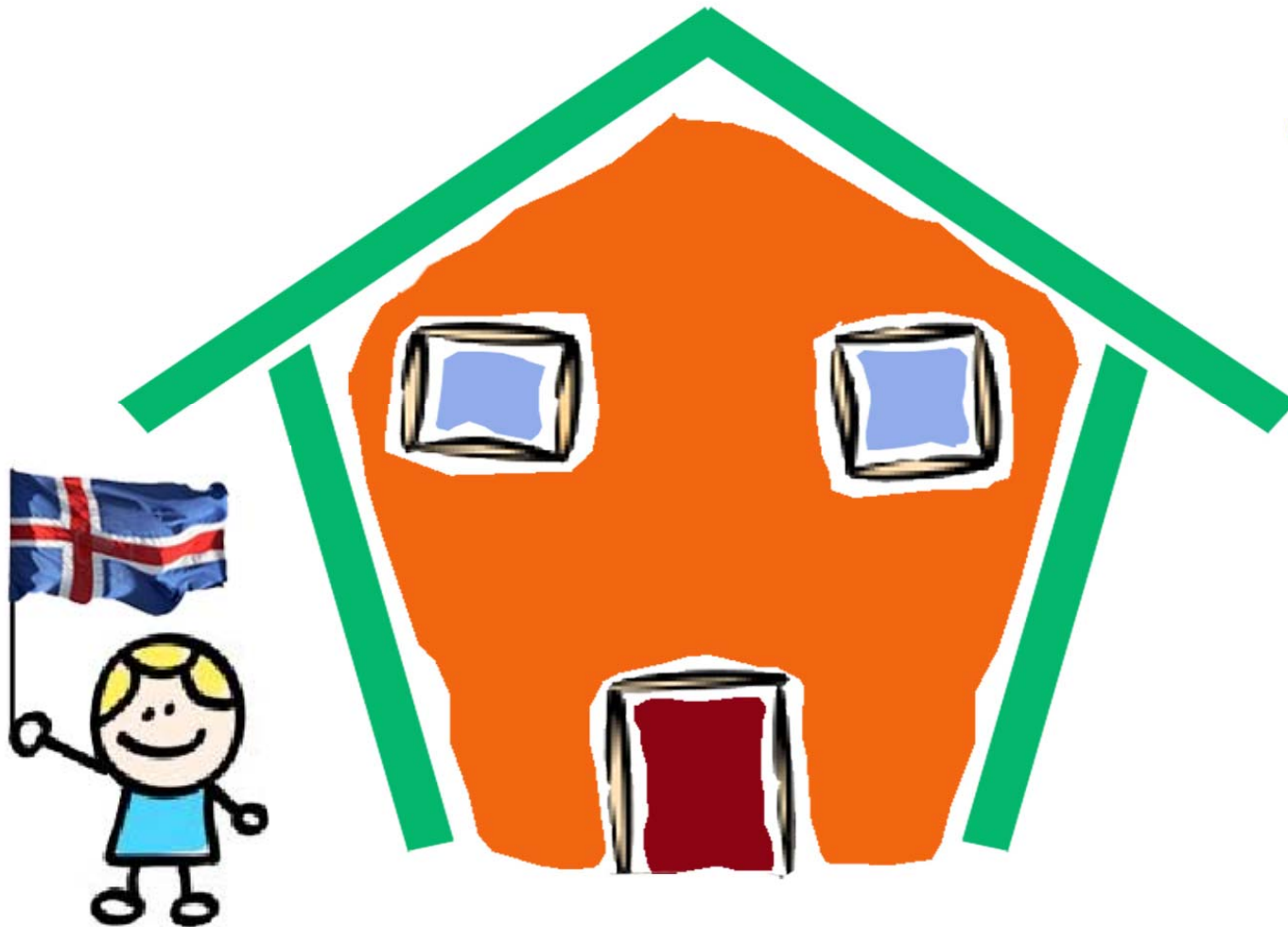
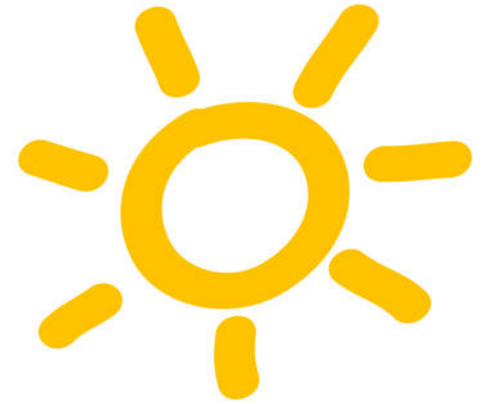
Preparing the "green roof"



The finished house



ICELAND



ICELAND GREEN HOUSE



DESIGN

Green street 16

The house is made of concrete with steel frame and insulated with stonewool. Thick 6 inch to keep the warm inside. The roof is iron on top to keep water and snow out. All the water that comes on the roof goes in to pipes and under the house in tanks. The water is used for the hot-pot, bath, shower, the washer and the sink.



DESIGN

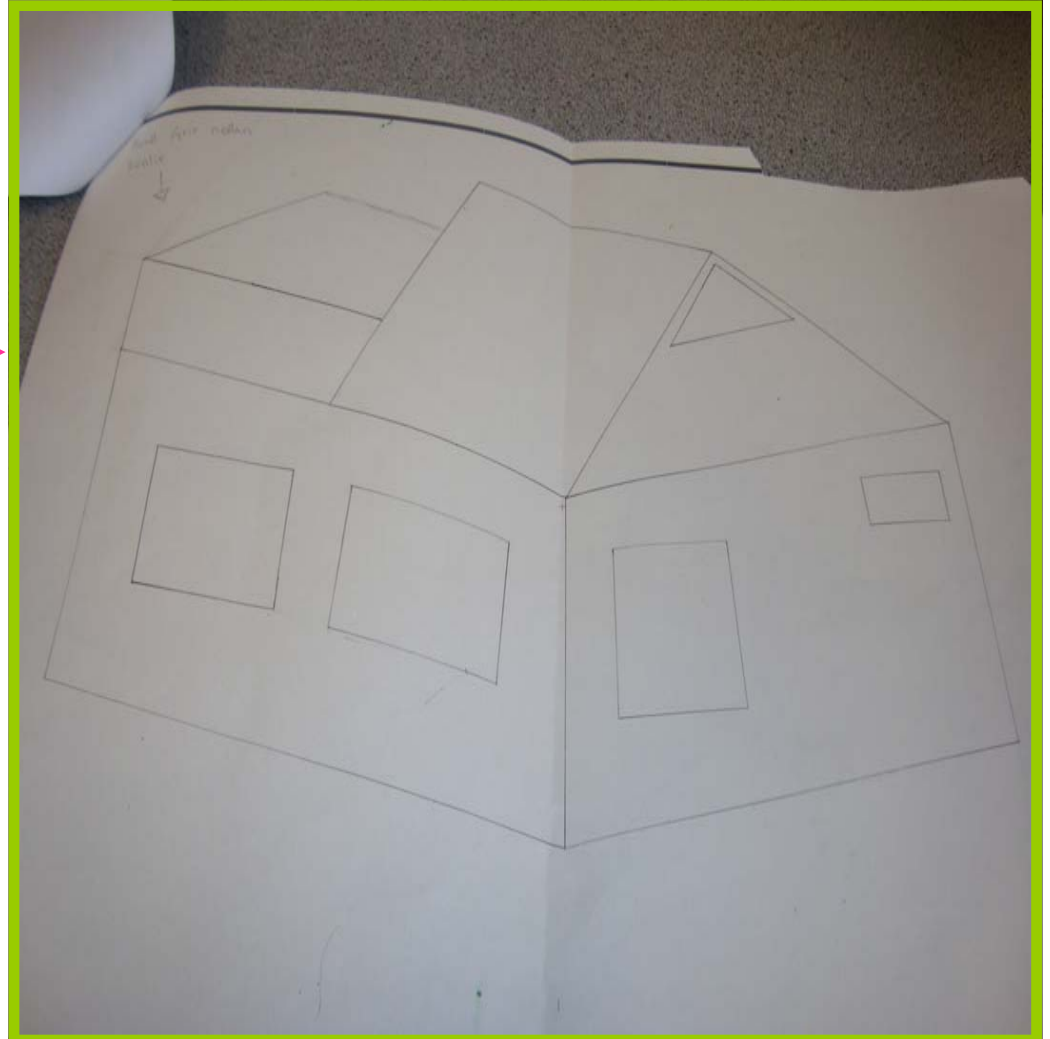
The fence on the balcony is a sunenergy taker and uses the energy for the house and the hot-pot. Then we have big windows so we don't have to use the energy so much. We recycle and put organic waste in to green trash barrels. Soon it will be a good soil for plants. So we can grow our own vegetables. We heat our house with heat control system.



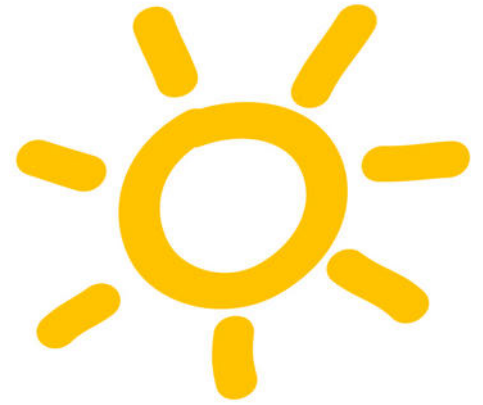
DESIGN



Pupils drew the project of the green house



ITALY



ITALIAN GREEN HOUSE



Participants: classes IC and ID, IIB, IIIB, IVC and IVD, VC and VD

Parents participants to the project:

DESIGN

We looked back in our ancient origins and history in the Romans time to take suggestions for our green house. The roman domus has been our inspiring model and the idea of a house that has to be resistant, usable and art- like and homely as the ancient roman architect Vitruvio maintained and of course autonomous and sustainable.

As in the roman house, the 'atrium', an open air room in the center, is a source of light and the hub of the house. All around it there are the different rooms.

The two screens of the entrance and of the dining-room/living-room on the atrium are two large windows that give roominess and lightness and beautiful view from inside.

A part of the roof is green and flat and the other is tile sloping roof.

There is a porch all along the south and east sides of the house.

The walls of the west and the front sides are covered with bricks of tuff that is a local stone.



DESIGN



View of Inside

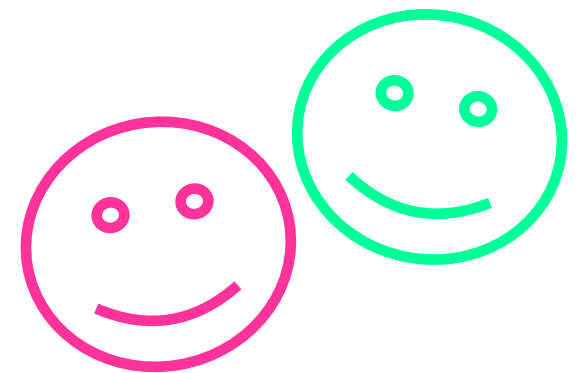


MATERIALS

- Building materials are natural, environment respecting and local to spare on the transportation.
- The outer walls are made of several layers for the best insulation from the outer temperature and humidity.
- Insulating coating with wooden fiber and the rediscovered plaster made with cocchiopesto that ancient Romans used.
- Tricks of tuff (a volcanic local stone) for two outer walls, the north and the west.
- Wooden floor



MATERIALS



SAVING ENERGY

The thermal insulation is the most efficient measurement for reducing the energy needs. Insulated walls and roof, protected windows from the direct rays of the sun and few small windows in the north side are the main aspects of the house as saving energy. We have first to reduce the needs of energy and then to produce it.

For the same item a local domotic plant for the automatic control of the use of energy is a very important way of reducing the waste of energy.

Solar and photovoltaic panels on the roof make the house selfish for every need and to power the radiating floor that make the house warm heating the raining collected water in winter refreshing it in summer.

The panels surface of the roof can be automatically opened to let air circulate in the house.



SAVING ENERGY

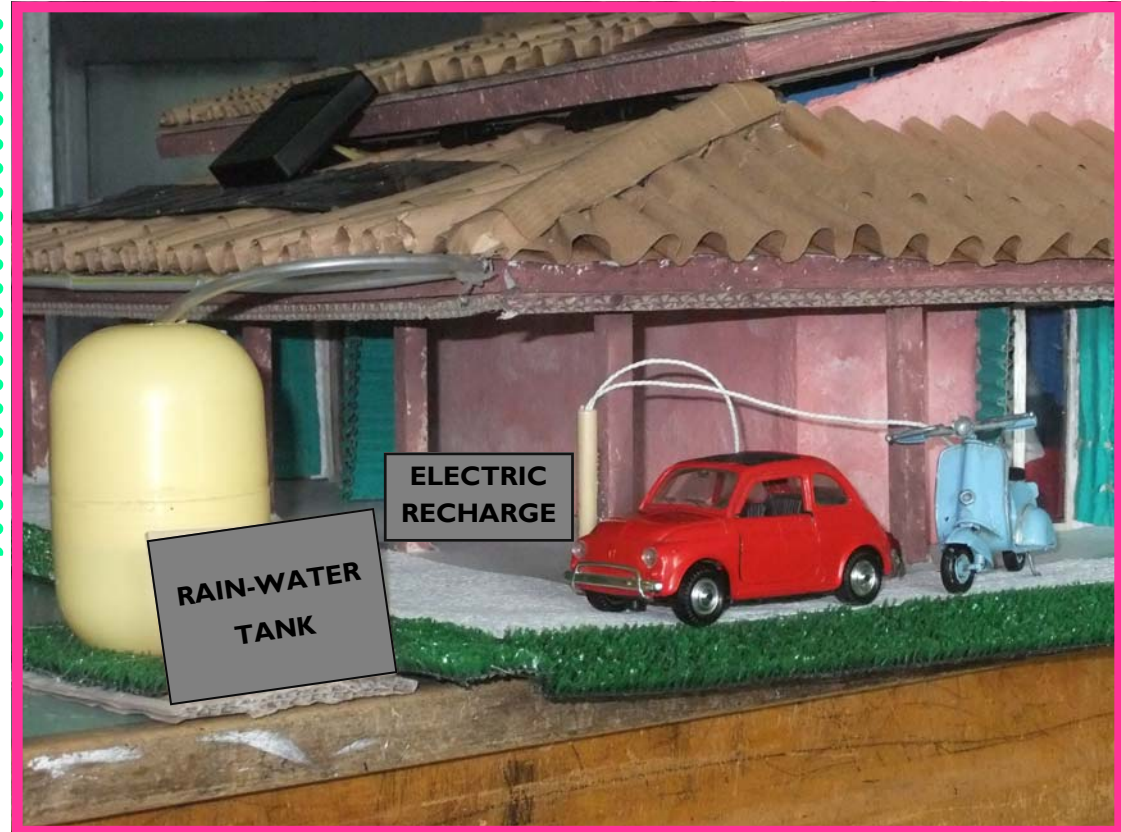


RECYCLING

Rain water is collected in a water butt and reused for domestic purposes and for irrigation. The water is also pre-treated in the kitchen to make it pure and drinkable.

Organic rubbish is collected in a composter and then compost is used to fertilize the gardens.

Solar and photovoltaic panels are a way of recycling.



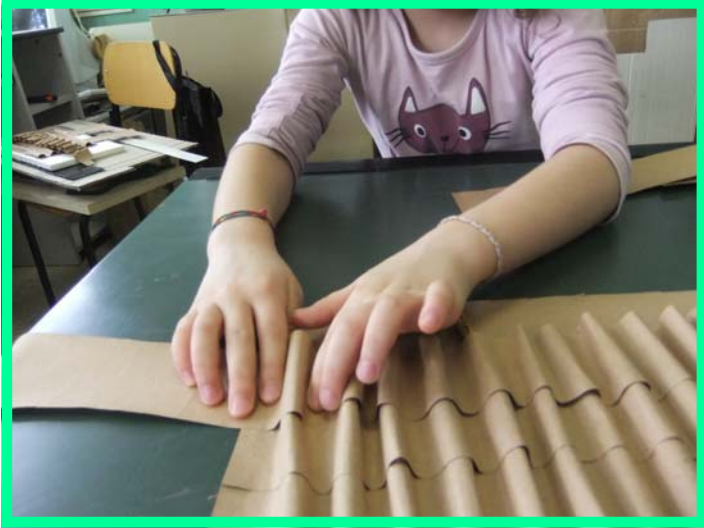
WHAT MAKES THE HOUSE „GREEN“

Our house is a zero CO2 emission house. Solar and photovoltaic panels and reduce energy waste make it selfish.

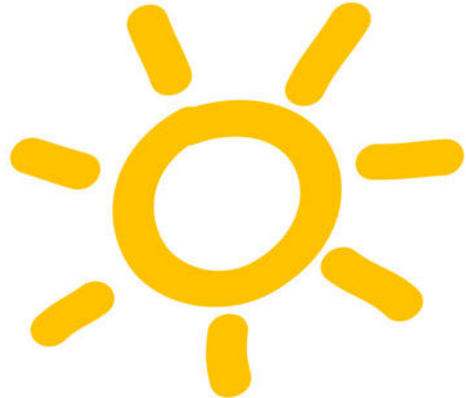
Natural building materials and separate collecting rubbish make it respecting environment. The green roof and the atrium little garden with the idea of growing Mediterranean plants make it really green colored too.



THE CONSTRUCTION OF OUR HOUSE



NORWAY



NORWEGIAN GREEN HOUSE



Large windows is important for the design.

- It is a modern house with two floors.
- The roof is flat and is used to “harvest” the rainwater.
- The first floor is one open space with a large window. The house has got a colourful interior design.



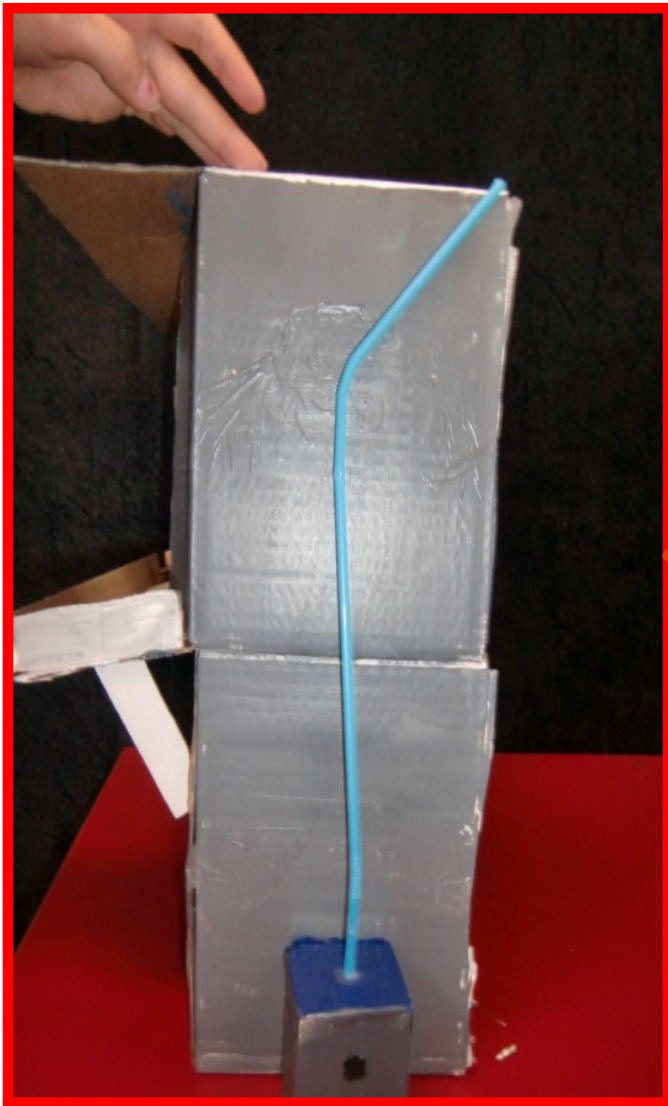
DESIGN

- * Put one cardboard box on top of another.
- * Paint the house grey, and the roof white.
- * Make a big window upstairs.
- Use a transparency film as glass in.



- * Divide the ground floor in two rooms with a wall made of cardboard. This will be the bedroom and the bathroom.
- * Put a bed in the right corner of the bedroom.
- * Put one water saving shower in the bathroom.
- * Put in tapestry on the floor in the bathroom, ca: 4.4 cm.
- * First floor: The kitchen is to the right and the living room to the left.
- * Put a recycle bin in the kitchen. The recycle bin is divided into three
- * compartments: plastic, paper and food.
- * Put a black stove and a light blue refrigerator in the kitchen.

DESIGN



Make a rainwater harvesting system:

- * Draw a grid on the roof.
- * Put a little box (water chamber) on one of the short sides.
- * Put a straw from the roof to the top of the box.
- * Paint the top of the box blue.



Use aluminum foil to make a sun collector on the other side of the house.

MATERIALS

The house is made of two cardboard boxes.

Walls and furniture are mainly made of cardboard.


Transparency film is used as triple-glazed windows.

Felt is used as insulation under the roof and in the walls.

Tapestry is used to decorate the walls inside the house.

Outside the “wooden panel” is painted.

Aluminum foil is used to make a sun collector.



Large windows is important for the design.



SAVING ENERGY

- The house has got a large window in the living room. This window is facing south to take advantage of the daylight and the heat from the sun.
- They have a water saving shower.
- The roof and walls are insulated.
- A sun collector supplies the house with electricity.
- A rainwater harvesting system supplies the house with water – not drinking water.
- The house has got two storeys. Then they can take advantage of the heat from the ground floor.

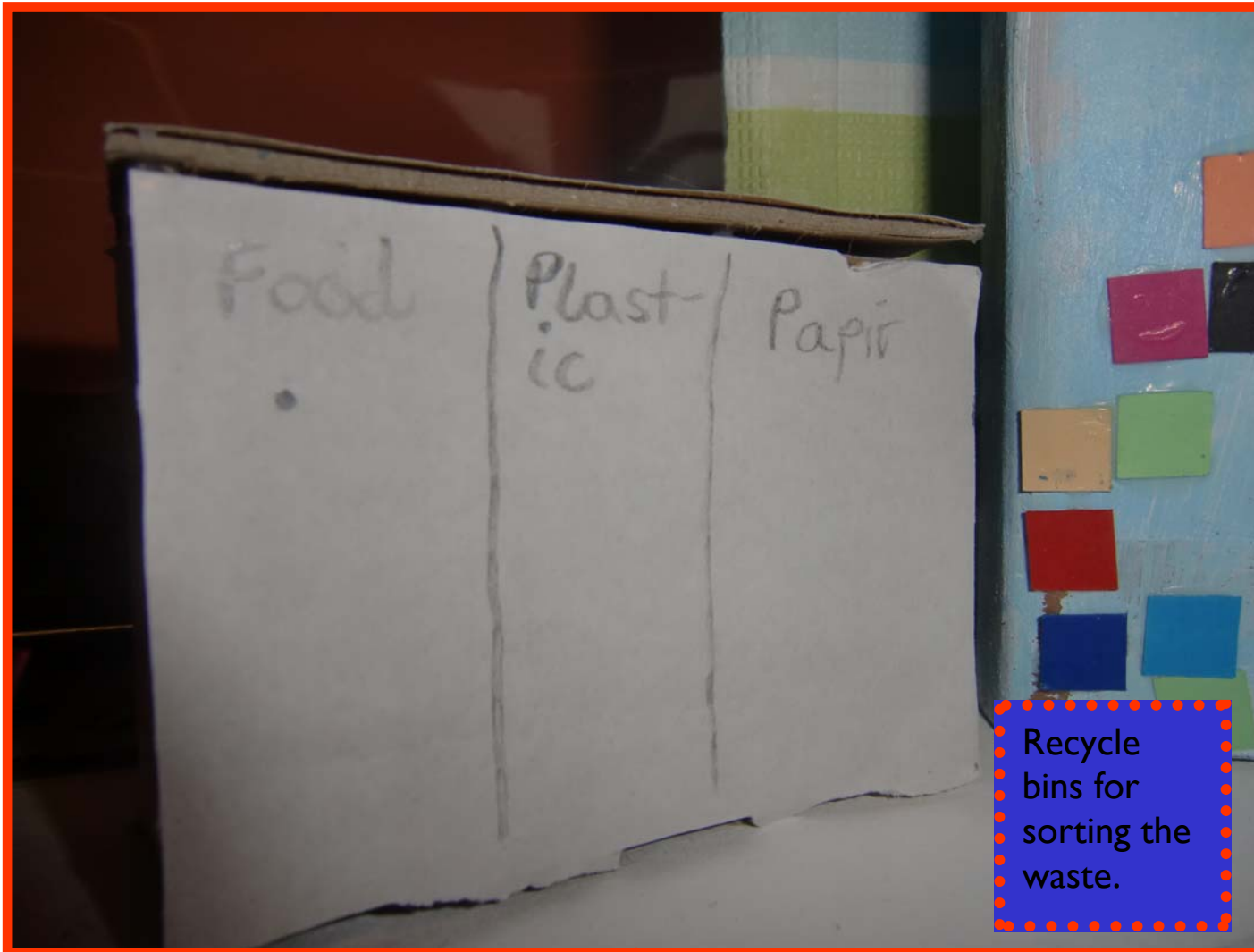


Saving shower

Solar cells



RECYCLING



- There is a big recycle bin in the kitchen.
- It contains three compartments for sorting the waste: paper, plastic and organic waste (food etc.).



WHAT MAKES THE HOUSE „GREEN“

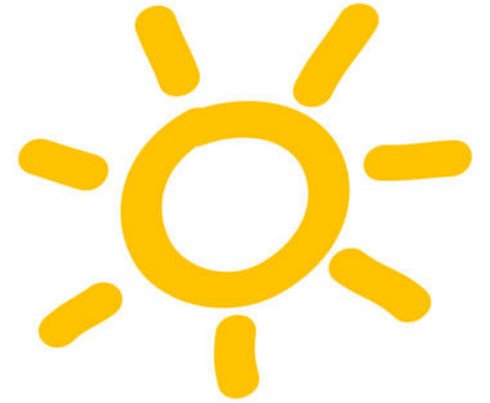


This house is environmentally friendly because it has got several energy saving installations.

They produce some of the electricity they need with a sun collector, and they use rainwater in their household (shower, washing etc.).

They sort the waste for recycling.

POLAND



POLISH GREEN HOUSE



The house is a detached house which is energy self sufficient and ecologically friendly. It also reflects traditional architecture of Polish houses. It has got a habitable attic where the bedrooms are situated, a terrace, a small winter garden, an entrance through the porch supported by two columns, and a balcony above it.

DESIGN

The front of the house with a fence, a gate and a porch.



The eastern wall.



The western wall with a terrace, winter garden and solar panels on the roof.



DESIGN



In the house all furniture is made of natural materials, there are wooden floors and stairs. The house is decorated with handmade tapestries, and woven woolen kelims. There are also fur seat covers on the sofa a carpet on the floor.



MATERIALS

- ⇒ Ceramic bricks
- ⇒ 15 cm polystyrene insulation of walls
- ⇒ Roof made of bitumen tiles with mineral wool insulation
- ⇒ Double glazed windows with external blinds
- ⇒ Solar panels on the roof
- ⇒ Wind turbine on a mast near the house



SAVING ENERGY

To save energy we use:

- ♦ solar panels and a small wind turbine for lighting the house – the metal containers are heat exchangers
- ♦ using heat from the earth
- ♦ there is a home biogas power plant (the three white containers behind the bathroom – one produces gas from wc waste water, the other from composte, the third one is for mixing gases) – gas is used for cooking and for heating the floor.



SAVING ENERGY

- ◆ We use a recuperation system – getting the energy back from chimney wall and the attic mainly in the summer
- ◆ using Smart Grid technology the surpluses of energy from the house are returned to urban energetic system
- ◆ we use energy saving home appliances and light bulbs.



RECYCLING



- ◆ Wastewater from toilets are used for producing gas
- ◆ Rain water is collected for watering the garden, one of the containers is traditional Slavonic kneading trough - near the kitchen which than supplies with water the shallow pond in front of the window (it reflects the sun and gives additional light)
- ◆ Plastic, glass and paper is segregated for recycling – three containers near the gate.



WHAT MAKES THE HOUSE „GREEN“

- ◆ Using renewable sources of energy – solar panels, wind turbine, heat from earth
- ◆ Home production of gas for cooking and heating
- ◆ Recycling water, paper, glass and plastic
- ◆ Using energy-saving appliances
- ◆ Using natural materials
- ◆ Homemade food- meat smoked in a little wooden tower on the terrace, home-grown vegetables and fruit.



THE CONSTRUCTION OF OUR HOUSE



CONCLUSION

“The real voyage of discovery consists not in seeking new landscapes but in having new eyes”

M. Proust

...and new friends for sharing experiences

