

PRACTICAL ECOLOGY II

Training Course

from the 22th of July to the 1st of August 2014

BEDEILLE - France

TECHNICAL BOOKLET



Association SOLAFRIKA
www.solafrika.com

With the support of:



STATEMENT OF INTENT

PRACTICAL ECOLOGY II

The purpose of this TC was to promote a healthy way of life and respectful of the environment, for students and workers of the education and social fields.

The aim of this project was to inform, transfer some know-how and give tools to the participants and their organization to lead ecological actions.

The purpose was also to make the European participants more aware of the environmental issues.

To do so, we tried to create discussions and debates about ecology but also cooperation between people of different culture and way of life.

THE ACTIVITIES

The activities were well divided between theoretical knowledge and practical one.

The week started with:

- workshop about ecological sanitation,
- visit of an insect clearing to understand the importance of insect in the ecosystem,
- making of ecological cleaning products,
- a botanic discovery workshop,
- earrings with bottles caps,
- visit of different organization linked with ecology in town.

Then during two days, participants were lead to build different alternative systems :

- clay oven,
- solar cooker,
- economical wood cooker,
- wood tiles and clay bricks,
- wood water heater.

Those workshops allowed the participants to become aware of their abilities and they got enough knowledge to be able to reproduce the devices made in other conditions and other places for their own use or projects.

All of those workshops allowed the creation of a group dynamics and developed

cooperation between the participants.

GIVING VALUES AND TRANSFERING KNOW-HOW

The last part of this project consisted of practising the ability to explain and do with others what had been learnt during the TC.

A group of members from various organizations in the same field than the topic (environmental protection) came to visit us. This way, the participants could show and explain all the devices and activities done during the TC.

This part was very important to us because it put in to practice the work of the participants, and also allowed discussion around ecology between the locals organization's members and the participants.

This moment was an intense cultural exchange between the locals and the Europeans. It was also a way to increase the participants' self confidence.

THE TECHNICAL BOOKLET

The technical booklet that you have in your hand was entirely written and built (except for the page setting) by the participants of this TC.

Every workshop is described in this booklet.

One or two supervisor was chosen for each activity, and was responsible for the writing and the pictures for the technical booklet.

This booklet was send to every participant, for them to use as a tool to reproduce and improve the devices described and the knowledge acquired in the development of their projects in the youth filed.

HYDRAULIC CYCLES

Workshop by Terr'Eau

We use about 150 liters per person a day :

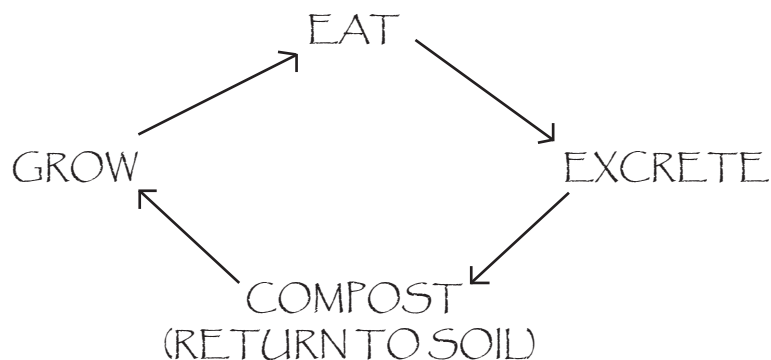
- Outsidewater (garden , car washing) ca. 30 l,
- Greywater (sink , tub, shower , washingmachine) ca. 90 l,
- Blackwater (flush toilets) ca. 30 l.

All these kinds of water are mixed together and emptied in normal water, like rivers, lakes, sea...

Problems :

- enviromental : - eutrophication
- diseases , death of animals...
 - health impacts : Diarhea, acute gastroenteritis...
- 80 % of french Waste Water Treatment Plant don't meet up with the standards for liquids descharges.

So we have to rethink sanitation :



DRY TOILETS DON'T BREAK THE CIRCLE. FLUSH TOILETS DO !

Basic principle of ecological sanitation :

Treating separately excreta (urin and feces) and greywater...

HYDRAULIC CYCLES

Two different types of dry toilets :

1. composting toilets with dry carbonic matter (wood chips, sawdust...) to avoid smell, flies and achieve balance between carbon and nitrogen,
2. urine diverting dry toilets, separation of feces and urine (special toilet seat).

GREYWATER :

- you can use it for the garden,
- few pathogens,
- big amount of nitrogen.

There are two ways to treat your greywater :

1. planted filters treatment, not really the plants but bacteriologic life around the roots,
2. soil-based greywater treatment.

Then we improved Solafrikas greywater treatment :



And this is the new greywater treatment in Solafrika's house !



RECYCLED EARRINGS

MATERIALS LIST :

- Bottle caps
- textiles
- glue
- staples
- beads
- ear- hangers

MANUFACTURING STEPS :

1. Make 4 caps flat and round with hammer on ball on the back of car.

Make a little hole with something sharp at the edge of the cap.



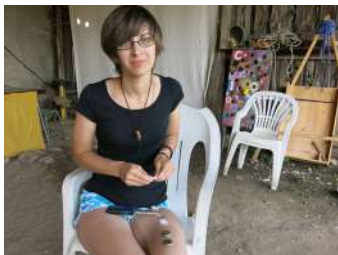
2. Choose the right textile and cut it round.



3. Put the glue on the cap and glue it to the textile. Glue also the back part of a cap and stick it to the bottom part of another cap.

4. Finish your earrings with staples , beads and ear- hangers.

5. Enjoy wearing your recycled earrings !





SOLAR COOKER

TECHNICAL CHARACTERISTICS :

Energy Used : 0 cost (sun energy)

Price : 150 euros

Dimensions : 1m tall, 40cm x 50cm

Device Life : very long !

Saving : saves wood or any other cooking material. Uses only sun energy !

MATERIALS LIST :

- peaces of wood for frame,
- wood screws,
- plastic glue,
- wood glue,
- aluminium paper,
- plexiglas,
- plastic mirrors,
- polystyrene,
- black pot,
- lot of love !

BENEFITS :

works only on renewable energy, cheap to make, prepared food stays more nutritious, portable.

DISADVANTAGES :

takes a longer time to prepare food, works only in day time and when there is sun, needs special cooking pots.

TECHNICAL STEPS :

1) Screw legs together, for top walls leave some space for thermo-isolation :



2) Glue aluminium inside the box and on the top, fill walls with polysterine :



3) Put mirror panel together and glue mirrors :



SOLAR COOKER

4) Cut hall in the top part for the pot you will use :



5) Fasten mirror panel to the frame and screw the top to the frame.
For the top put some soft tape on top of the frame in order to avoid halls between the top and the frame.





ECONOMICAL WOOD COOKER

TECHNICAL CHARACTERISTICS :

Energy Used : Wood

Price : 40 euros

Dimensions : 50 cm tall, diameter = 50 cm

Device Life : very long

Saving : 50 % of wood usually used.

MATERIALS LIST :

- piece of metal,
- metal bin
- bricks

BENEFITS :

- Using recycle materials,
- Saving 50% of heat .

DISADVANTAGES :

- Hard to recycle.

MANUFACTURING STEPS :

1- MAKE THE ELBOW

1. Cut a form for elbow from piece of metal. (Horizontal and Vertical)



2. Make holes for screws with hammer.

3. Bring together both sides using screw. (Looks like king's crown.)



4. Fold back parts with arrows.



ECONOMICAL WOOD COOKER

5. Bring together H with V and fix them using screws.



6. Using hammer hit the standing-out parts to connect them with elbow.



II - MAKE THE BOX

7. Draw and cut a circle (smaller than elbow's one) on the top and on side of the box.



ECONOMICAL WOOD COOKER

8. Cut small cogs and fold them back.



9. Place an elbow in the box, cover it.



10. Using hammer tight cogs.





ECONOMICAL WOOD COOKER

III - MAKE THE BELT

11. Cut a straight piece of metal long enough to make a circle around box's top.
12. Fix the belt with screws, place it on the top of box.



13. Cut the brick on three parts, place them in the belt.



14. Now you can use your wood cooker!





CLAY BREAD OVEN

MATERIALS LIST :

- Clay Ground
- Straw
- Nails
- Sand
- Wood Tablet (75*80cm)
- Tarp

MANUFACTURING STEPS :

- 1) Draw a circle of 75 cm diameter on the wood tablet. (Choose the bigger side for the oven opening.)
- 2) First, coating layer of 4 cm of the following mix : 1 bucket of clay ground for 6 buckets of straw, of the size of the circle on the wood board.



- 3) Second coating : 1 bucket of straw + 1 bucket of clay ground. Put it on the first layer, removing 3.5 centimeters on the sides comparing to the first circle.
- 4) Third coating : 1 bucket of clay ground + 3 buckets of sand. Remove 3.5 centimeters comparing to the second coating. Do an overhang for the opening. The door, large of 30 cm, will be located between the circle and this overhang. Cover with «Barbotine» (liquid clay ground) on the last layer.





CLAY BREAD OVEN

5) Door to cut. Half a circle 30 cm large and 16 cm high. Put a piece of wood in height to allow wedging it and seizing it, and put plastic paperboard or piece of sheet metal on the top of the door to support the following layers.

Let's this basis structure to dry for a day.

6) Do a rounded roof with sand 21 cm high (fill the void with something else like glass bottles...). This will be used as a pattern for the following layers and will be removed at the end.



7) Mix of 1 bucket of clay ground for 4 buckets of sand. Layer of 3.5 cm Do marks with your fingers at the end to prevent him from bursting.

8) Mix of about 1 bucket and a half of straw for 40% of a bucket of clay ground. Layer of 3.5 cm.

9) Mix of 1 bucket of clay ground for 1 bucket of straw, layer of 3.5 cm.

10) Finishing stage: mix of 1 bucket of straw for 1 bucket of clay ground for half a bucket of sand. Possibilities of adding completions according to what you want: shapes, colors, lime coating...





WOOD TILES

MATERIALS LIST :

- Chestnut Tree,
- Different kind of «Plane» (special french old tool to cut wood ; translation in english doesn't exist...).



MANUFACTURING STEPS :

1. You need a trunk of chestnut tree
2. Cut a trunk into four pieces using a saw . They should be the same size so at first you mark a cross and the middle of the cross should also be the middle of the trunk.



3. Take one piece of wood and cut from this one flat piece. After that you have to divide them into two smaller ones.



4. Use a special tool to make a plane surface of the tile and actually shape it how you want.



Done:)



CLAY BRICKS

MATERIALS LIST :

- Clay
- Straw/grass/sawdust
- Sand
- Water



MANUFACTURING STEPS :

1. Dig up some clay.



2. Mix it with water and sand. Last ingredient is grass or sawdust or straw or you can take them all as well. It depends on a purpose a brick. If you want to make isolation bricks you should take straw and sawdust. If you want to make it heavy you should take only grass.



3. The mixture should be homogeneous. Then you can start making a brick in a special form.







4. After forming just store them until they got dry. Takes around three weeks.

Done:)








DISCOVERING OF WILD PLANTS

Which Plant ?	Properties	Picture
Dwarf Mallow	Used medicine internally as tea or externally as baths for treatment of disorders of the skin, gastrointestinal tract and respiratory tract. Young leaves can be put into salad.	
Plantain	Young leaves can be used in salads. It has some antibacterial and anti-inflammatory properties so can be used for healing insect bites, little wounds, cuts, bruises, swelling. Just chew a bit on the leaf and then rub it in smoothly on the wounded area.	
Oregano	Full of vitamin K, manganese, iron, calcium. You can use it as a spice, make tea or oil from it. It has antiseptic, relaxing properties, brings back the appetite and is good for digestion and easing the cough. In the back days leaves have been used as tobacco.	
Wild Chicory	Good for cleansing the liver. The leaves are edible and are best in the early spring until the blossoms appear. The buds are edible also and good for stomach. From the root picked in the late autumn it is possible to make coffee: dry it, then roast it a bit in the oven, grind it and drink it.	









DISCOVERING OF WILD PLANTS

Which Plant ?	Properties	Picture
Clover	High in protein, a good source of calcium, potassium, vitamin C, magnesium. Leaves a good to eat raw before it blossoms, after it is recommended to cook it. The blossoms are good raw, cooked or in teas.	
Dandelion	All parts are edible raw, cooked or dried. It's a liver tonic and a detox, stimulates digestion, full of vitamins A and D. The flowers are widely used in making wine, but can be used in salads just like the young leaves. It is recommended to cook the roots before eating.	
Daylily	Tasty and used in very well known in Asian kitchen. Use the flower buds raw in salad, fry it, put into stews.	
Blackberry Bush	Young leaves are used in salad. Leaf tea is good for treating diarrhea, mouth inflammations.	
St. John's Wort	Teas are used for treating depression, insomnia, moodiness. An oil can be made from St. John's wort: a heap of the plant is added to the olive oil and left in the sun for 3 - 4 weeks. When it becomes red - squeeze it and it's ready to use. Apply this oil to the skin to treat bruises and scrapes, inflammation and muscle pain, first degree burns, wounds, bug bites, hemorrhoids, and nerve pain.	



DISCOVERING OF WILD PLANTS

Which Plant ?	Properties	Picture
Oxalis	A blood cleaner. You can eat the leaves in salad or make lemonade: add some leaves to water and let it stay for two hours and then it's ready to use.	
Elder Flower	Jams, syrups and lemonades can be made.	
Rose	petals can be used in salades, to give a flavor to drinkable water.	
Milfoil	Has detox properties, is used to treat menstrual disorders, helps digestion, acts as a disinfectant and an anti-inflammatory when applied externally. Usually consumed as tea. Young leaves are used in salad.	
Yarrow	Young leaves are used for salade, tea made from the blossoms is good for ladies.	
Nettles	Good blood builder, full of vitamins, increases the flow of urine. The herb can be used in food, tea, external use to strengthen the hair. (My favourite tea is - nettle, lime and honey)	



DISCOVERING OF WILD PLANTS : RECIPES

NETTLE PESTO:

You need : 1 bag nettle, 1 lemon juice, 1 glass of olive oil, some garlik, sun flower seeds, peper, salt.

You have to : Boil the nettles in water for 5 min. Put away the water, squeez lemon in, put grated garlic, olive oil, salt, peper and blend it well. If you want to put sun flowers - soak them in the water overnight.

FLOWER BUTTER:

Put the blossoms of clover, rose petals, dwarf mallow, hemerocallis, dandelion into a bowl. Add butter and mix it all carefully with a fork. Keep in the fridge for 1 hour.



SALAD:

Pick young plantain leaves, dandelion leaves, wild chicory leaves.



NETTLE AND CHOCOLATE CAKE :

125 gr of flour, nettles, 200 gr chocolqte, 70 gr sugar,
4 eggs, 90 gr of butter, salt and leavening.

PLANTAIN CREAM :

200 gr cream, salt and pepper, lemon, plantain

EDIBLE DRINK :

1 cucumber, plantain and nettle, youghourt (natural, not flavoured), lemon, salt and pepper.



ECOLOGICAL CLEANING PRODUCTS

These products are 50% less expensive than your usual cleaning products...

MATERIALS LIST :

- water (and a cooker to heat it),
- alcohol vinegar (or white vinegar) : to remove the fat, deodorize, disinfect, descaling, antiparasite,
- sodium bicarbonate (or baking soda) : to neutralize the acid (so all the bad smells), to clean, and it's a sweet abrasive too,
- black soap : more efficient than the household soap to clean the house,
- household soap (in France it's called « Marseille soap ») : it's ideal for the laundry,
- neutral liquid soap : multi-use product, you can replace it by ecological washing-up liquid.
- essential oils : please see the list besides.

That's it for the products that you will need. If you buy them at once, it will be a little bit expensive, but you will have them for a long time, and it's actually 50% less expensive than your usual budget for your cleaning products. So it's ecological and economical!

ESSENTIAL OILS :

You can use a lot of different essential oils, it depends the properties ; here is a list (english and latin names) :

- lemon (citrus limon),
- scots pine (pinus sylvestris),
- eucalyptus tree (eucalyptus radiata, eucalyptus globulus),
- fir tree (abies balsamea),
- peppermint (mentha piperita),
- spike lavender (lavandula spica or latifolia cineolifera),
- citronella grass (cymbopogon nardus),
- grapefruit (citrus paradisi).

And this is the strongest oils :

- tea tree (melaleuca alternifolia),
- cinnamon (cinnamomum cassia or cinnamomum verum),
- thyme (thymus vulgaris),
- clove (eugenia caryophyllus).

All these essential oils have a lot of different properties. For most of them, they can be used in your daily life, as a treatment or to take away insects for exemple. You can check on Internet and find all the directions to use them ! Enjoy :)

BE CAREFUL : not go over the recommended quantities ! Some of them are caustics on the skin (like the cinnamon). Some of them can be very toxic if you swallow them! They are not dangerous products, you just have to be careful with them, take information before using it, and respect the quantities...

ECOLOGICAL CLEANING PRODUCTS

THE RECIPES:

(Quantities for one bottle of each product)

MULTI-USE DISINFECTANT

Ingredients: sodium bicarbonate, alcohol vinegar, essential oil, water.

Material: opaque can of two liters, funnel, tablespoon, glass.

- 1) Put 2 tablespoons of sodium bicarbonate in the can (easier with a funnel).
- 2) Heat up 2 liters of water, put them in the can and mix it with the sodium bicarbonate.
- 3) In a glass, put 1 tablespoon of alcohol vinegar (easier with a funnel), one tablespoon of lemon oil, one tablespoon of pine oil, one table spoon of cinnamon oil. Put the mix in the big can.
- 4) Shake it strongly.

Directions for use: Shake it strongly before each use. Put a little quantity of it in a bucket of hot water. You can use it purely when you want to disinfectant something (your bin for example).

WASHING-UP LIQUID

Ingredients: water, sodium bicarbonate, neutral liquid soap, the oil that you want to perfume your product!

Material: empty flask of washing-up liquid (of 500 ml), funnel, teaspoon, tablespoon.

- 1) Put 1 teaspoon of sodium bicarbonate in the flask.
- 2) Fill one sixth of the volume of the flask with neutral liquid soap.
- 3) Fill the rest of the flask with water.
- 4) Put 15 to 20 drops of essential oil.
- 5) Shake it carefully (be careful with bubbles :))!

ECOLOGICAL CLEANING PRODUCTS

THE RECIPES:

(Quantities for one bottle of each product)

SCOURING CREAM

Ingredients: sodium bicarbonate, salt, neutral liquid soap, water, the essential oil that you want to perfume it.

Material: Opaque flask of 500 ml, funnel, tablespoon.

- 1) Half-fill the flask with sodium bicarbonate with the funnel.
- 2) Fill one fifth of the volume of the flask with cooking salt.
- 3) Put one tablespoon of neutral liquid soap.
- 4) Put 15 to 20 drops of essential oil.
- 5) Fill the flask with water. Shake it.

Directions for use: It's very important to shake it before each use. Be careful with delicate surfaces (like ceramic), because of the salt.

If you have to scour ceramic, use the fast recipe:

Dust your surface with sodium bicarbonate, and scrub with a wet sponge with a little bit of washing-up liquid.

TOILETS CLEANER:

Ingredients: alcohol vinegar water, tea-tree oil.

Material: spray of 500 ml, teaspoon.

- 1) One third of alcohol vinegar,
- 2) two third of water.

ECOLOGICAL CLEANING PRODUCTS

3) 2 teaspoons of Tea-tree

Directions of use: spray it into the toilets; leave it to work 15 to 20 minutes, brush.

WASHING LIQUID:

Ingredients: 100 grams of small chips of household soap, 2 liters of water, sodium bicarbonate, tea-tree oil.

Material: Empty flask of 3 liters, tablespoon, wood spatula.

- 1) Put your soap chips in the flask.
- 2) Heat up 2 liters of water, and fill the flask with it.
- 3) Put 3 tablespoons of sodium bicarbonate in the flask.
- 4) Get it colder.
- 5) Add 7 drops of tea-tree oil.
- 6) Leave it work during 24 hours, for a better appearance.

If you let it work during 24 hours, add one liter of cold water, and mix it with the spatula.

Directions of use: if you don't have enough time, it doesn't matter if you can't wait 24 hours; the appearance of your product will be a little bit weird, but it works really good anyway!

It's very important to shake it before each use!



ECOLOGICAL CLEANING PRODUCTS

GOOD THINGS TO KNOW :

- If you don't have alcohol vinegar you can replace it with lemon juice.
- You can use the sodium bicarbonate once by week (not more) to wash your teeth, it make them whiter and also under the arms for the smells as talc powder.
- You can use the black soap alone, or in little quantity with hot water to clean the ground (tiles and linoleum), to clean ovens, cooker hoods, window panes...
- You can find the material in organics shops and hardware shops.
- You can use white vinegar + washing product as softener product after a first wash for the laundry.
- You can use a rest of coffee to wash your skin, hands,... (if you have oil, gazol for example on the hands).
- You can use also ashes for washing painting.
- You can use sand for washing fat on dishes.
- You can also use green clay to brush your teeth, wash your skin (as a mask on the face)...
- You can use kéfir for sunburn or white yoghurt and no low fat.

IMPORTANT TO KNOW

- Don't confuse sodium bicarbonate with caustic soda which is very dangerous ! They look very similar !
- If you wash different material, be careful about the products to be sure to don't damage it.



VISIT OF THE INSECTS CLEARING

The clearing is not affected by any chemicals, the owner takes care of the place with love and attention. The clearing is a garden for the insects.

GOOD THINGS TO KNOW

- Spiders have eight legs but insects have six legs. We can easily recognise animals by legs.



- A fly sees 140 pictures in a second and a dragonfly sees 200 pictures in a second.

- Butterflies have scales on their wings which catch the energy from the sun. That is why they can fly only two hours during the night.

- Butterflies live only three weeks and the males live even shorter.

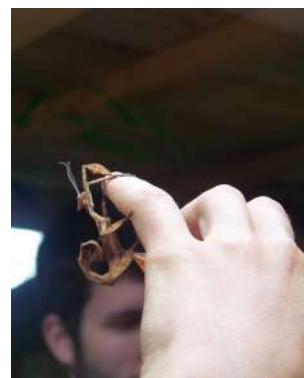


- The males die after breeding.

- Butterflies communicate with each others using wings.

- There is one species of flower for one species of butterfly.

VISIT OF THE INSECTS CLEARING





WOOD WATER HEATER

The aim of this project was heating water with ecological resources. We used wood as resource because it's a renewable energy. In fact it is a resource that we can find almost everywhere. The carbon released in the atmosphere by the combustion of wood is the same that the one is taking by the tree to grow up. So when the combustion is complete (not too many smoke or carbon monoxide in the gases) we don't touch the balance of carbon in the air like we do when we use coal energy for example.

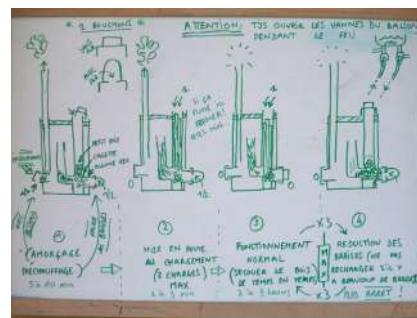
So how to take a warm bath in front of the mountains under the sky without polluting?

First we need to prepare the place where we want to put the bath tub. We chose to put it against a wall to win time (one wall is less time to build). We isolated the wall and the floor under the tub with clay, it's also used to stick the tub. The cub is the material we used to build the wall. It's a mixture of straw, sand, cork and of course clay. The aim is to create a closed space all around the bath for the circulation of warm air and the smoke. In an easier way you need a fire point in front of the bath which creates smokes and an extraction point to evacuate the smokes which is in the closed space.

About the extraction point: it's a long vertical pipeline and at its base you have a « T » shaped piece with three exits, one linked with the pipeline, one linked to the closed space to collect the smoke and the last one connected with the outside where we can put a little oil lamp.

That is used when you start the wood water heater. It's done to create a draft to orient well the direction of the smoke. After a few minutes, when the fire is good you can close the exit.

The fire point is built with bricks which resists to high temperature and it's covered with cub. There are two kind of tanks : in the first one you put the wood vertically. Here is where you start the fire. The tank is combined with an air system (three holes in a brick). The air is mixed with the hot coal and creates flames in another tank linked to the first one. After that, the warm air and the smoke can circulate around the tub and heat it.





WOOD WATER HEATER

These is a little summary of what we did step by step:

Step 1: chose a place, isolate the wall and the floor with clay



Step 2: prepare the mixture of cub

Step 3: build the wall around the bath tub



Step 4: build the fire system with bricks and make the extraction system



WOOD WATER HEATER

Step 5: do the finish with a mixture of clay and sand
(without straw)



Step 6: wait for the cub to dry (the time to dry depends on the weather) - normally it is around a week



Step 7: start the fire and take a bath



Step 8: Enjoy it!

Conclusion

It was a really great experience to do in this training course. We can find all the materials (except the iron pipeline) in the environment easily. You can also use this kind of system to heat water in your house with a water circulation.



WOOD WATER HEATER

Hypothesis:

Maybe we can improve our system if we level up the bath tub with bricks or something else to create a space under the tube. This time with a bath on the floor the smoke heats only the side of the tub. When we reduce time of heating, we reduce also amount of resources.

And least funny thing - you can give any shape you want when you use cub, so is easy to finish with esthetical touch. For example our tube has a shape of a bear :



DON'T STOP ME NOW...



THANKS TO...

Erasmus + Program



The French National Agency
(especially Alice Dartout)

Our Partners

SIRENA (Slovenia)
Saltes (Lithuania)
EDUQ (Poland)
Biodiversa (Spain)
L'Africa Chiama (Italia)
EYCB (Czech Republic)
Terr'eau, Des 2 mains, La clairière aux insectes, Anne

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Adèle
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Joe

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