



***How to Build
a Self-Sustaining BioHouse
Technologically Applied***

AbundioTeca

Can you dig that the title of this guide, only facilitates the search of the friendly spider sniffer of the largest advertising agency oriented, award, in your home page is certainly installed.

In the "Practical Guide for the sale of houses", outlining the steps to follow to the most important time to become users of real estate, though, does not seem to you more challenging and fun build your own nest?

Will an ingenious **challenge and challenge** where you will use construction techniques **more advanced** using the most effective methods known to date. Main objective, to achieve sustainability **and self-sufficiency functional** , being simultaneously **respectful with the environment and nature** .

In addition, os **you will release energy dependence** to supply networks monetarily oriented, and you will obtain detoxify the cumbersome process imposed by local authorities.

With respect to costs, does not mean any difference. Welcome to your new independence.

What is the first thing we need? Indeed, a **field** . Not necessarily reclassified, of any type will be appropriate.

In any case zoned, since the territorial expropriation is inevitable. As well as **rustic or urban** , a decision of the human being.

Obviously, it will be much cheaper to buy a rustic plot, preferable in this case because I don't need any services and/or supply installed.

The surface extension will be indifferent, but at least **1,500 m2** of plot it would be desirable. Access also will be important, although not relevant.

If easies for urban land , you will be subject to planning criteria to limit the **occupancy and construction** of your home. In addition, you must pay **municipal taxes** , licenses, which will considerably increase the cost of your housing, in some cases, up to 10 %, while half are located in the 6 %. Also you will be **prey to technocrats credentialist with limited point of view**.

However, if you choose to build an immovable, body anchored that cannot move, will be mandatory access to urban land. And what do you think it **should be able of the IBI?**, although not all, since by the field if you will pay this tax, much less in rustic land.

Although the construction that we are going to propose is directed to the manufacture of **movable property such as consolidated housing to use, self-reliant** , and **technologically advanced** , **there is also** the possibility of converting them into real estate. The only difference lies in the foundations, anchored and fixed to immovable property.

A **movable**, can be changed in place, that is to say, it is susceptible to **displacement**. This condition gives you several advantages; **tax-free** municipal, **geographic mobility** , **simple repair** , **bottom time** of construction, **technical precision and razor** since its components are assembled and mounted in the workshop, **multifunctional design** , **not can be expropriated or garnishment for** any administration (always and when they are not entered in the register of movable property), **scalable, modular** , etc...

However, we must comply with certain standards of habitability by adjusting our movable to the same. To do this, consult **and engage the services of an architect** , which, in addition, design your dwelling as you indicate anything. Although you were showered with and lay it out yourselves.

If you are followers of the security that ensures the legal ownership of property, renouncing the possible expropriation or

however, you can **register your movables in the register of movable property**. The decision is yours, although would invoices for all services and products contracted for proving ownership.

However, it would be appropriate register it if one day you decide make a onerous transmission, or sell it. In the latter case, the ITP is **only 4 %** , half, another big saving.

What do you have similar advantages, indeed, are very nice. But, in addition to the substantial monetary savings, mobility, design, institutional release, etc...we are going to go further in this manual.

We will apply **building systems** made with materials of **low environmental impact, eco friendly, recyclable, low-cost, reusable, and biocompatible**, that is to say, all of them together will be adapted to us, and promote a **sustainable development**. Although this is not the whole story, we will add a **high technological component** that fits the above premises.

We will have to take into account the management of soil, air, water, energy, and consumption-local development

Below, we present the Decalogue of bioconstruction:

1) Appropriate location. Avoid the proximity of sources emitting electrical and electromagnetic pollution, chemical and noise, such as: polluting factories, big channels of communication, high voltage power lines, substations and processing centers , etc. ..., as well as the settlement on geological faults or streams (elements of telurismo referred to in the geobiology) .Also should be avoided where, by man's actions can be jeopardized any given ecosystem.

2) Integration in its closest environment. In response to the morphology of the terrain, adjacent buildings, the traditional

architectural styles of the area, including vegetation characteristic of the place of harmony and constructive ways. "The key is to be found in the attitude that we must take the time to establish a settlement, this must be of integration and not occupation"

3) Custom Design. According to the needs of the user, in a process of continuous interaction with the by the designer, in such a way that the housing you will adapt and serve perfectly to develop in her way of life. An effort will be made, to the extent possible, taking care of the effect "waveform", thus avoiding the excessively straight elements, with sharp corners. They are not convenient materials overly rigid and/or distressed. The great lights can be saved with arches, vaults, etc. The spatial proportions, as well as the forms and colors play a large role in the harmonization of the place.

4) Appropriate orientation and distribution of spaces. They also respond to the logic of distribution services, as well as bioclimatic considerations on energy saving and functional. Will be prosecuted whenever possible a good guidance. The glazing will be screened for the appropriate maximum thermal and luminous advantage (with walls and floors of high thermal inertia).

Situation of stays of little use to the North (garages, pantries, ladders, etc. ..) and Day areas to the South.

There will be a very special attention to the study of the resting places, thereby avoiding the vertical lines within the same electricity, water or any other type ...

5) Use of healthy materials, and biocompatible hygroscopic. They should facilitate the exchange of moisture between the housing and the atmosphere. **The housing must "breathe "**. The material must be of raw material at least developed as possible

and be as close as possible to the work (use resources of the area). Must be completely exempt from harmful elements such as asbestos, polyurethane, chlorine, PVC (used very common today).

The ducts **of sanitation** of large diameter can be made of ceramic **with connections of rubber** and the small diameter of PP (Polypropylene), PB (polybutylene) and/or PE (Polyethylene) rather than PVC. With these materials, the pipes are more stable, flexible, durable and less noisy. For the electrical conductors, already exist in the market of halogen free cables and PVC-free, as well as tube-polypropylene curling.

We would avoid the **isolates and paintings** closed pore plasticized, retaining elements of electrostatic powder (carpets, plastic soils ...) and all those materials that emit toxic gases when burned. We must use **the silicate paints, water, linseed oil, rosin, natural waxes**, etc. .., as well as, for the decorative elements, wood treatments and plasters or lucid.

In the structural elements, we'll use **cement or natural hydraulic lime**. The use of steel must be restricted to what is essential and should be conveniently bypassed to ground. However we can resort to stainless steel.

Today are heavily abused the structural elements of reinforced concrete, such as beams, pillars and wrought iron work, especially the joists of reinforced concrete rovings, which contain steel with a voltage-twist permanent, when in many cases they can be replaced by cantilevered walls, trusses, arches and vaults.

There are several reasons to avoid the use of reinforced concrete. On the one hand, the steel that gives it rigidity, it also creates internal tensions (especially to traction) and altering the natural magnetic field. This affects the pituitary gland, which is responsible for the secretion of melatonin during the night, especially sensitive time for our agency, since when it is time to regenerate.

These tensions also persist in the time altering the vibrational field.

On the other hand, the Portland cement is composed of fly ash and slag that affect steel in various directions to the sustainability and health:

- To raise the electric potential and radioactive (because it is baked to more than 1450 °C) favors the driving of the radon gas (radioactive gas) that rises up from the subsoil (especially where there are rocks and granite cloaks) and accumulates in the spaces below the houses.

- The cement, in addition to having a high energy cost (1.23Kw/Kg), has a shorter life span than expected, especially in those places are exposed to high conductivity, as are the foundations, which to be buried in the presence of moisture and high conductivity, accelerating the decomposition by molecular "pair-galvanic" and causing the premature oxidation of the clanking, in an inaccessible place, as is the cementing, and which we do not realize until it appears a sinister structural.

Reinforced concrete has the disadvantage of having an index, employee in Geobiology, of "vital energy" very low (less than 3600 Bovis, when what is normal for the human being is of 6400 Bovis). An example is the clay that in no case of the 7200 low Bovis. That is why this material "absorbs Vital Energy" us and medicaments we take don t work.

The alternative to the reinforced concrete

The alternative is the **hydraulic lime armed with bamboo or stainless steel with ground**, independent of the electrical. In those cases it is difficult to acquire hydraulic lime can be replaced by free natural cements of fly ash and slag steel (such as for example the cement "Tiger", "house of the pront Vicat" , "Puma",

"Zumaia" or the "Mallorcan"), or in his absence, the white cement BL-1A.

Alternatively, there is a "BIOCONCRETE"™, which has the same composition as the conventional concrete but the binder used is the cal. There is also the nanocal which replaces the cement, for example, the Geosilex. This type of "BIOCONCRETE"™ is lightened rice husks or sawdust, and, in the part of the gravel was replaced by ex-clay or perlite that have less impact on the environment, and, finally obtiene a lighter product with better insulating properties.

6) Optimization of natural resources. It is highly recommended that you perform a study of resources of the place, in such a way that we can determine the natural elements that we can make some kind of "work" without limiting its longevity, to keep in mind: Climatology, insolation (incoming solar radiation and temporality, Geology and hydrological rainfall, prevailing winds (force, temporality and address), Biomass, Ecosystems

Throughout history, the first element of analysis for the choice of location as human settlement, has been the **water** . This is the primary element that influences the sustainability of a settlement. Today we have to consider it a scarce resource. There will be a special care with the treatment of water, its uptake, accumulation, its use, debugging, reuse, and their return to the natural environment.

The catchment is suitable to realize mine in a horizontal (if possible), if not, we must look the phreatic level or a vein of water. OR even **channeling and accumulate rainwater**. Water tanks **must be protected from light and heat, as well as constructed with natural materials** . Its use must be responsible and austere.

It is recommended that you **separate the gray water** (wash basins, sinks, showers) **from the black waters** (toilets) to be treated efficiently and to be able to **debug applications biological form for subsequent reuse**.

Efforts be made to take advantage of the **sunlight** (solar radiation) as a primordial element **of lighting and as a source of energy for the heating of facings and solar collectors**. In the same way we can **produce electricity from photovoltaic panels**.

One must take into consideration the prevailing winds, its intensity, direction, and temporality. With this we will be able to take **air conditioning systems based on the principle of "differential pressure in ventilation ducts and/or freshening"**, as well as take measures to prevent its possible conditions by placing biological screens.

Introduce elements for the **natural air conditioning** , as masses of forest, lagoons, sunths solar thermal power plants, greenhouses, green covers, etc. ..

Also the implementation of the **renewable energy** usable in that particular place (such as wind turbines, hydraulic turbines, solar panels, biomass, etc. ..), as well as the use of construction materials of the place.

7) Establishment of systems and equipment for the savings. Use of the **bioclimatic**, through catchment systems passive solar, galleries of controlled ventilation systems, water plant regulators of the temperature and humidity. Sunt thermo ventilation. Eaves adequately designed.

Preferably **cantilevered walls that provide thermal inertia, with insulation to the outside**. In **facades** with strong insolation can be incorporated into **screens ventilated** .

Perennial vegetation to the North and expires, the South, East and West. Where the weather permits, it is useful to incorporate **plant covers flood. Atomisers for saving water in the taps** . Those that are used for showering should be thermostatic.

Furniture Equipment for low-impact and ergonomic configuration, energy efficient household appliances and low emissivity and electromagnetic ion, zero emission of microwave

and gamma waves, etc. ... with proper grounding, that do not emit harmful gases and its elements are natural enclosures. It must take into account not only the optimum layout of the furniture, but also your own geometric shape and contour.

8) Incorporation of systems and equipment clean production.

After a study of the natural resources of the place and needs to cover, we can determine the most appropriate systems to obtain the energy that we need, such as e.g. :

Solar-Termica with flat panels, hubs or vacuum tubes to meet the needs of domestic hot water and space heating. We can also produce cold with solar energy, geothermal, biomass, biogas, through machines of absorption. Using solar ovens and/or parabolic concentrators we can obtain the energy needed for cooking the food in more than 75% of the days.

Geothermal in those places that have next any magma vein and/or steam coming from the basement, through exchangers for all types of heat treatments such as those covered the solar thermal.

Biomass from forestry waste for the support of the Solar-Termica

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Biogas from the anaerobic digesters of the WPPS for the support of the Solar-Termica .

Solar-Fotovoltaica for electricity production.

Hydraulic for electricity generation as well as those machines that require a driving force. Its use must be considered restricted to those places where their impact is minimal.

Wind exactly equal to the hydraulic. Its use must be considered restricted to those places where their impact is minimal.

9) Program for waste recovery and purification of discharges.

Waste separation at source, with recycling program and if it is

possible reuse of the inorganic solids as well as composting of organic. We should pay special attention to the purification of waste water for later use, e.g. in irrigation. In places with large water shortages should be incorporated into organic systems of dehydration or "WCs dry" with its subsequent composting program.

10) User Manual for use and maintenance. In detailing the actions that must be performed by the user and must do the maintainer professional.

Generally, this type of building follows the guidelines of the constructive process traditional "in situ", by subtracting accuracy and effectiveness to the work accomplished. We will introduce a variable that will reverse this deficiency, the **mechanization and automation of the constructive process**, i.e. **perform all the steps in workshop by complying with the definition of movable**. Slapdash, you need not dress scarves cool to carry out your project.

This new technique recognizes the efficiency of current technology, using a type **modular construction** done in the factory that uses **robotic systems** to reduce costs and construction times, that is to say, will produce large and small **LEGO blocks** which will be assembled definitively in the chosen location

Where do we start', then we formulated a plan of action for all the multiple phases of building in workshop that includes a list of sustainable materials and functional:

Since we are going to build a movable with the dimensions that we deem appropriate, and may occupy even 100 % of the plot, first we have to prepare the soil for the BioVivienda is capable of transporting. To this end, we will use a **foundation** that will leave the prefabricated housing above the ground securely anchored. However, in many cases they will have to first prepare the field to

undertake this type of foundation. There are several types, well that will depend on the project that will ultimately make headway.

When you lift the housing of the soil, will be below the health wrought some **underground galleries that will cool the air** picked up from an entry located in the northern part of the housing. Thus, in summer the housing cool free of charge by the night air with completely natural. In winter, there will be only to close the louvers.

Given that the air contains on many occasions harmful particles for the human being, we will install **other macromolecules in the louvers** to breathe pure air completely. This technology is available in www.openms.com. Although the cotton would be valid also humidified

In these underground galleries, forged under the health, will be installed the different lines of the housing. Please consult the decalogue of bioconstruction materials to use.

With regard to the **structure will be completely prefabricated**, where, the degree of industrialization is **maximum**, the manufacture of all parts of **the housing is very precise**, the variety of items from **union will be** very wide (screws, profiles, etc...).

This type of construction generates multiple **advantages**; **existent waste, dry mounting, repair and easy mounting, portability of the whole assembly, life cycle infinity**, etc...

The materials chosen for the structure shall comply with the criteria of bioconstruction, and, all of them shall be recoverable thus facilitating the repair and maintenance of the housing. That is, they will be precicables, which involves recovery and reuse already that the recycling generates and consumes a lot unnecessary energy.

There are many prefabricated structures, since, will depend on factors such as isolation or thickness of slabs of concrete, the typology of the BioHouse final. However, we have listed the most simple and usual:

Structure composed of an interrelated set of plates of reinforced concrete, as a structural system for load-bearing walls. The foils prefabricated reinforced concrete will have a thickness of 8 cm in the walls, and 12 cm in the forged. The outer walls of the east and west will be composed of two sheets and insulation. The inner sheet corresponds to the load-bearing walls of reinforced concrete at 8 cm thick (with high thermal inertia). The outer sheet is composed of gypsum boards-hydrophobic cellulose. In the interior of the sheet there is a double layer of insulation of hemp of 5 cm and a chamber of air vented 3 cm. The north and south facades are composed of walls of a single layer, on the basis of concrete blocks, stuffed with insulation (coffee bags discarded).

Structure with prefabricated walls of two leaves and insulation. The leaf interior constitutes a load-bearing wall of reinforced concrete of 15 cm thick (with high thermal inertia). The outer sheet is made of reinforced concrete prefabricated lightened of 6 cm. In the interior of the sheet there is a double layer of insulation of hemp of 5 cm and a chamber of air vented 3 cm. In some places of the facade has been replaced the outer panel of concrete, by a ventilated facade to database of Ipe wood treated with vegetable oils. The forged has been carried out on the basis of plates of precast reinforced concrete.

Remember, always give the criteria of Bio for the components in the structure. There are more substitutes for structures that you can consult with your designer.

The structure and foundation of the BioHouse, another important element of isolation of external agents such as the sun, and/or

maintain the temperature of the same, will be the cover. We propose the following, and may introduce other materials that may alter it but remains equally effective:

Landscaped Roof, with an average thickness of 30 cm of soil. Deck tilted to basis of sandwich panel composed by: upper panel Viroc (wood shavings and cement) of 13 mm, bottom panel of birch plywood of 13 mm, and internal insulation of hemp fiber of 10 cm thickness. Other coatings can be made from a sheet of rubber, and a coating of zinc plates.

In the proposed structures included natural isolates of great effectiveness, however there is a wide variety with similar functionality: cork oak, cellulose paper recycling with salts of borax, panels of straw and cal, granulated of pine bark with salts of borax, dehydrated pasta rice-husk, bark of hazelnuts, almonds and walnuts treated with includes sodium pentaborate, lightweight panel of hemp, etc.

The insulation is advisable **place it toward the outside**, with rupture of thermal bridge on the structural elements, to work as elements of thermal inertia. In addition, they must also have the following features; impervious to water, vapor permeable, conductors, which do not alter the natural magnetic field and that after their useful life are easily recovered, recycled or reused in another application.

All facilities **ducts (electricity and water)** will be added during and after the placement of the insulation. Just have to be used the materials proposed in the ten commandments of Bioconstruction; lines of polypropylene / polyethylene or ceramic for the conduits of water and sanitation, halogen-free cables for the entire electrical installation, good grounding for properly derived the electric and magnetic fields of all devices on the housing, etc...

After placing all the facilities will have to cover them with **interior finishes** such as; sandwich panels, panels with different compositions and insulating glass partitions, high-performance,

etc...all of these finishes are composed of materials: organic, recyclable, biodegradable, with great capacity thermal and acoustic, breathable, non-toxic, extreme durability, in short, respectful with the environment and the human being. A few paragraphs above listing some of these insulators (cork, cellulose, hemp, etc...).

On multiple occasions complete panels are made with the insulation between two layers included, interior and exterior, for example; sandwich panels with insulating core of cork, outer face of chipboard hydrophobic, and inner side of bamboo or wood. These applications will be placed on walls and ceilings being its flexible mounting and dry, without any additives or glue, and, with simple maintenance treaty with vegetable oils.

We can include in the finished interior paints and **tilings** . With respect to the plant paintings will be on the inside and the silicates in the outside. In the heading of tilings will not be used any type of glue or cement, will be mounted and may be dry; panels of Silestone dropped, tilings of parquet with contrachapo bamboo, tilings of tiles with porcelain stoneware, etc... The choice is yours.

It may occur that the **exterior finishes** are fully integrate into the prefabricated walls of "BIOCONCRETE"™ armed, however, if you do not choose this option more simple, it will be necessary to realize them. Among the commons, we find: ventilated facades with profiles and pieces of stoneware with an inner chamber for the sake of preserving the average temperature in winter and prevent the sunlight in summer, solar shields hardwood IPE, awnings of cotton canvas, tables and rastreladas groove verticals of Ipe wood termotradas and dyed with vegetable oils, etc...the latter, are often placed as external shutters located to the south orientation of the housing for the sake of protecting them from solar radiation and thus avoid the heating. Ultimately, all these external finishes protect the biovivienda of external agents.

The integration of all components used in the construction of the BioHouse gives the same of a **bioclimatic characteristics** exceptional.

It is warmed up by itself while avoiding cool due to its high thermal insulation, and, acting as greenhouse as the largest glazed surface is to the south.

Cools itself by avoiding heat up thanks to its large number of guards installed (landscaped roof, solid wood shutters of IPE, etc. .), also cools through the system of underground galleries (The outside air space of the shading of the north is refreshed on a raft in the water is sprayed. Through some hatches this air enters the galleries located below the health wrought. This space eventually floods of water. Once inside, the air gives up its heat to the labyrinthine framework of walls in these galleries, and is refreshed. The air gets to housing through the grates of the central space, where you see a fountain with a spray of water, thanks to which the air cools a bit more) , you can also cool evacuating the hot air from the interior through fireplaces with designs of sloped covers.

The ventilation of the building is made of natural and continuously through the own walls enclosing, allowing adequate ventilation, without energy loss. This type of ventilation is possible because all the materials used are breathable (concrete, insulation of hemp, paint the silicates), although the whole to have an behavior completely water repellent. In addition, you can use mechanical ventilation systems such as geothermal heat pumps.

The heat and cool generated will be accumulated and transferred between stays due to the typology of gates and walls of load installed.

The BioHouse systems will be with LED illumination that will save 80 per cent of energy, high-quality electrical appliances energy efficiency, doors of Iroco wood treated with vegetable oils

(bee wax or linseed), double glazing, etc...This type of game is very wide, so choose the one that you like.

And most importantly, will be **completely disconnected** from the supply network wasteful and monetarily oriented. To do this, make renewable energy systems that more appropriate or adapt to architectural design; photovoltaic solar panels, wind turbines, water tank with treatment and biological treatment, biomass, geothermal heat pumps, thermal panels, etc. .

In accordance with the principle of popular squares Applied, creation of associated interest through the correct dissemination of products and services functional methodically applied, and, in practicing the principle of massive expansion monetarily disinterested, then you can visit the following list of websites and links to information and associated content:

- Www.syntesystema.com
- Www.groupkatamia.com
- WWW.gestom.es
- Www.modelhogar.com
- Www.grupoamis.com
- Www.compacthabit.com
- Www.probicosl.com
- Www.noem.com
- Www.casabiopasiva.blogspot.com
- Www.casavita.com
- WWW.ecodome.es
- WWW.domes.es
- Www.casabioclimatica.com
- Www.tukabamboo.com
- Www.casasmodularesblochouse.blogspot.com.es
- Www.theblochouse.com
- WWW.b-house.It is

- [WWW.smart-home.it](http://www.smart-home.it)
- [WWW.exterior360.es](http://www.exterior360.es)
- [WWW.biohaus.es](http://www.biohaus.es)
- [WWW.eco-houses.it](http://www.eco-houses.it)
- [Http://www.youtube.com/watch?v=g6c4ghcjt8e](http://www.youtube.com/watch?v=g6c4ghcjt8e)
- [Http://blog.is-arquitectura.es/category/casas-prefabricadas/page/4/](http://blog.is-arquitectura.es/category/casas-prefabricadas/page/4/)
- [WWW.casaspretaporter.es](http://www.casaspretaporter.es)
- [WWW.tekdom.es](http://www.tekdom.es)
- [Www.ekoetxe.com](http://www.ekoetxe.com)
- [Www.generatuenergia.com](http://www.generatuenergia.com)
- [Www.livinghomes.net](http://www.livinghomes.net)
- [Http://een.iwt.be/sites/default/files/effizienzhausplus_elektromobil_en_auf_l1.pdf](http://een.iwt.be/sites/default/files/effizienzhausplus_elektromobil_en_auf_l1.pdf)
- [Www.eco-casas.net](http://www.eco-casas.net)
- [Www.casasecologicas.net](http://www.casasecologicas.net)
- [Www.ecototal.com](http://www.ecototal.com)
- [WWW.casadepaja.es](http://www.casadepaja.es)
- [Www.contenhouse.com](http://www.contenhouse.com)
- [Www.casas-steel.com](http://www.casas-steel.com)
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- [Www.redpermacultura.org](http://www.redpermacultura.org)
- [Www.casasdepaja.org](http://www.casasdepaja.org)
- [Www.ecogeotica.com](http://www.ecogeotica.com)
- [WWW.arquidia.es](http://www.arquidia.es)
- [Www.bioconstruccionmodular.net](http://www.bioconstruccionmodular.net)
- [WWW.edificiosprefabricados.es](http://www.edificiosprefabricados.es)
- [Www.lacasabioclimatica.blogspot.com.es](http://www.lacasabioclimatica.blogspot.com.es)
- [Www.construccionbioclimatica.blogspot.com](http://www.construccionbioclimatica.blogspot.com)
- [Www.casascontenedor.com](http://www.casascontenedor.com)
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- [Www.arquitecturaverde.blogspot.com](http://www.arquitecturaverde.blogspot.com)
- [Www.teycubermadera.com](http://www.teycubermadera.com)
- [WWW.ecovidrio.es](http://www.ecovidrio.es)
- [Www.termochip.com](http://www.termochip.com)

- WWW.ecomarc.es
- WWW.uniquehouses.es
- Www.futuriahome.com
- WWW.ecospacestudios.es
- Www.thermochip.com
- WWW.houses.iter.es
- Www.grupomera.com
- WWW.krion.es
- Www.sostenibilidad-es.org
- WWW.zbb.es
- Www.ecoartek.com
- Www.binishells.com
- Www.solaleya.com
- Www.oboxhousing.com

In addition, you can add the latest technological applications most advanced to date, subject to the lower rates of programd obsolescence, and, with a high degree of durability:

- **Termopaneles** (thermocouple psychrometers effect as insulation using crystals)
- **Glass Low-E**
- **Electrochromic Glass** (loses transparency when you apply an electrical current, thus avoiding the solar radiation and energy savings)
- **Flexible solar Laminates** that can be installed on any surface (walls, windows, roofs, etc...). Very soon, thanks to nanotechnology, the **paintings will be available photovoltaic** .
- **Ecological toilets** that do not require water and furthermore manufactured composting.
- **Passive Cleaning** via sensors with electrostatic charges to avoid the housing becomes dirty or between the dust.

- **Photocatalytic Nanoshell**, applied to the materials of the biovivienda so that they acquire new properties; **self-cleaning** , decontaminating, **anti-bacterial** , oleofobos, luminescent, anti-aging, protectors of the solar radiation, etc... In Spain, is a reference www.openms.com
- **Air Purifiers** using filtering nanotech.
- **Ergonomic furniture and functional, i.e. that** the design of all the paraphernalia of housing conform to our appearance.
- **Safe appliances** that allow you to cook healthy, always and when the food is also clear. In regard to the many cookware, you can view them in the following pages; www.conasi.com , www.mundovital.es , www.sojamatic.com . With regard to health, and power, accurate, and balanced, we recommend the book "Handbook of Instructions of the human body" by Francisco Llinares Coloma.

The technological innovations applied in this area are very diverse, as you'll see, go beyond lower blinds with the call button.

If you want to complement the construction of your Biovivienda, incorporating a workshop to manufacture yourselves tools and machinery industrial low-cost modular, visit the following link www.opensourceecology.org/wiki/Main_Page/es

However, below we propose a new concept for the future that exceeds and improves the molded and inefficient conventional architecture of houses square-rectangular:

Dome Homes , Geodesic; is the monolithic structure, made of one piece, stronger than there is to date, and that fewer resources used for its construction. In addition, occupies the greatest surface, do not have columns or breakage of thermal bridge, is resistant to all the elements (hurricanes, fire, etc...), can be placed in any environment or place in the world, its design has no limits, etc...

Manufacturing may be carried out in string from the modular extrusion using a 60-70 per cent less resources, therefore, the sustainability (absence of waste) and efficiency are the highest.

Adapting to the criteria of bioconstruction, can be built from; prestressed concrete and reinforced by adding a coating of flexible ceramic, or, "BIOCONCRETE"™ lightweight reinforced with carbon fibers.

For self-sufficiency, are covered in photovoltaic paintings (nanobiotechnology that replicates the photosynthesis through silicon nanowires), or, solar sheets attached to the crystals. Sensors with electrostatic charge (cleaning), Nanoshell photocatalytic (superpropiedades funcional), negative ionizers (air purification), etc..., will complete the construction process. Currently, all this technology is now available.

However, the cities also will be redesigned, but that is another story....

Welcome to the future, we are waiting for you.







Binishells images by



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