

La Fata Morgana

Introduction and project plan

Quilty Earth

PARTNERING FOR ECOLOGICAL INNOVATION AND DEVELOPMENT

16-1-2018

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1) The Quilty Earth concept

Quilty Earth is a revolutionary new concept that innovates for the well-being of planet earth and its people. We humans all know that our (consumption) behavior contributes to the burden of mother nature and also to ourselves. We know this is not beneficial and makes us (feel) *guilty* in a way. Overall, we feel occupied in a big system that does wrong. But how can we, as individuals, make a real difference? Of course we can eat less meat, but as an individual you want to see the impact of your actions and how it benefits the environment and yourself. Moreover, you want to change the system. That is why we started *Quilty Earth* and turning the world, in a figurative sense, upside down. We provide a platform for people and organizations from all over the world to partner together for innovation and development in order to sustain the well-being of the environment and humans.

We want to support the development of 'green' and 'blue' innovations and their usage by the mass public. Everybody is familiar with green innovations, but blue innovations are relatively new. They have a positive impact on people's quality of life. They function as a kind of artificial medical doctor and health coach. Blue innovations measure the physical, mental and social status of people and provide them with information on how they are doing and what they can do to improve their health and happiness. Hence, they can adapt their behavior but also get signals what to do, for instance to seek medical treatment or to call friend and ask how he/she is doing.

Our philosophy is that if you want to make beneficial innovations for nature and humans and change the system, you have to think in extremes. This is because the development of these innovations is very complex and costly. Simply put, you need money to produce them. That is why we need the more fortunate people, with a 'heart of green', to give us a start. We want to construct luxurious organic houses for them with a spectacular design and the most promising innovations in the world today. We name them "living-cocoons", which refers to a place where the innovations can develop, just like organisms can develop in a real cocoon. Living-cocoons can be built separately. But we aim to construct living-cocoon complexes who function as a system. Similar to nature, where everything is mutually connected with each other.

However, we have one important condition for buyers, namely that the living-cocoons also function as living-labs, where the technologies are further developed in the interaction with its residents. In other words, the green and blue innovations are not ready for the bigger consumer market yet, but are between prove of concept and commercial upscaling. These innovations are integrated in the living-cocoon complex and additionally combined with some existing innovations. The system as a whole has to produce synergetic effects and forms the foundation to which other technologies are connected. With the living lab we also include big data analysis and machine learning so that computer-intelligence can regulate the system into a more eco-efficient use of energy and reducing waste. Moreover, the house will contain the most advanced Artificial Intelligence (AI) and all kind of smart technologies. The living-cocoon complex is designed in such a way that when the innovations are fully developed they can be disintegrated and new innovations can be introduced into the complex. This is an ongoing continues process and part of the Quilty Earth concept.

Why are we doing that? The problem of many green and blue innovations is that they are developed in isolated plants far away from its final users. The whole process takes time and consumes money. And the outcomes are often insecure, especially in terms of commercial success. That is why inventors have difficulty to collect funding. This blocks the process and innovation of promising technologies, while mother nature and sometimes also humans are 'dying' waiting. Moreover, the planet and the human race benefit when the innovations are used by huge amounts of people. But now many developed technologies fail to be massively adopted, simple because they do not work properly or do

not create enough value for its end-users. Additionally, to make return on investment, the innovations are often too costly for the mass public. That is why only the wealthy can initially afford them.

We want to speed up this process and secure its value for end-users by bringing the end of the development process into the living-cocoon and let the (same) wealthy people pay for it. Real time feedback from end-users is much more valuable than scientific data only to improve the product and thereby increasing its success on the big market. Metaphorically you can compare this with the F1, where the latest innovations are put into the formula 1 car and are continuously modified and re-developed in the interaction with its driver. At a later stage, these improved innovations are scaled-up for mass productions so that everybody can profit from the technology.

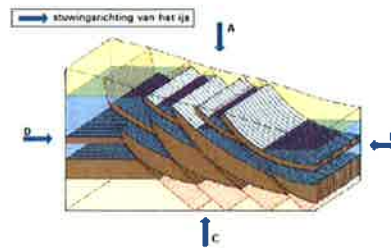
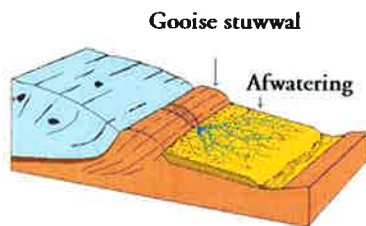
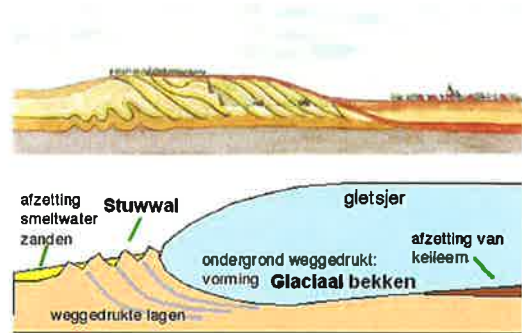
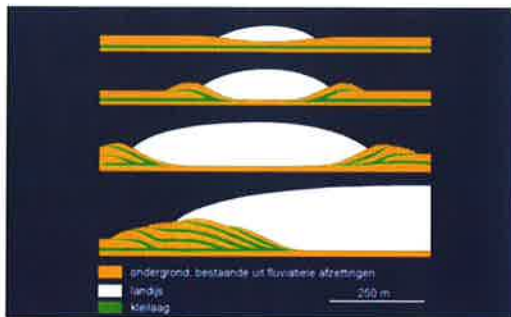
The next step to increase the adoption of the developed innovations and systems via the concept. That is why we need not only wealthy people to buy our living-cocoons, but also famous people that can promote it to the mass public. The adoption is certainly stimulated as, for instance, Leonardo di Caprio promotes a green or blue innovation in which he contributed. We assume that the fortunate and famous will embrace our concept, because in that way they can actually do something for mother nature and at the same time, can increase their personal well-being and enjoy their beautiful home with all its advanced technologies. And when they experience the impact on the environment and themselves, we are convinced that they become even more enthusiastic and genuine ambassadors of our project and the innovations.

Quilty Earth also wants to stimulate the adoption of eco-innovations by making the looks more attractive for the public. Quilty Earth commits to the highest standards of design. Not only in the shape and looks of the living-cocoons, but also in its interior design. Hence, we want to invite and challenge top designers from different disciplines to think with us and use their talent for aesthetically integrating green and blue innovations into the complex (like the haute couture). Not only to prove that beauty and ecological and medical developments can go hand in hand with each other, but also to make them more attractive for people to buy and use them in their own homes. We are more than convinced to attract the right persons and organizations to give shape to the concept and the living-cocoon complexes, given the fact that we already found some renowned strategic partners and sub-partners (in this early stage of the process).

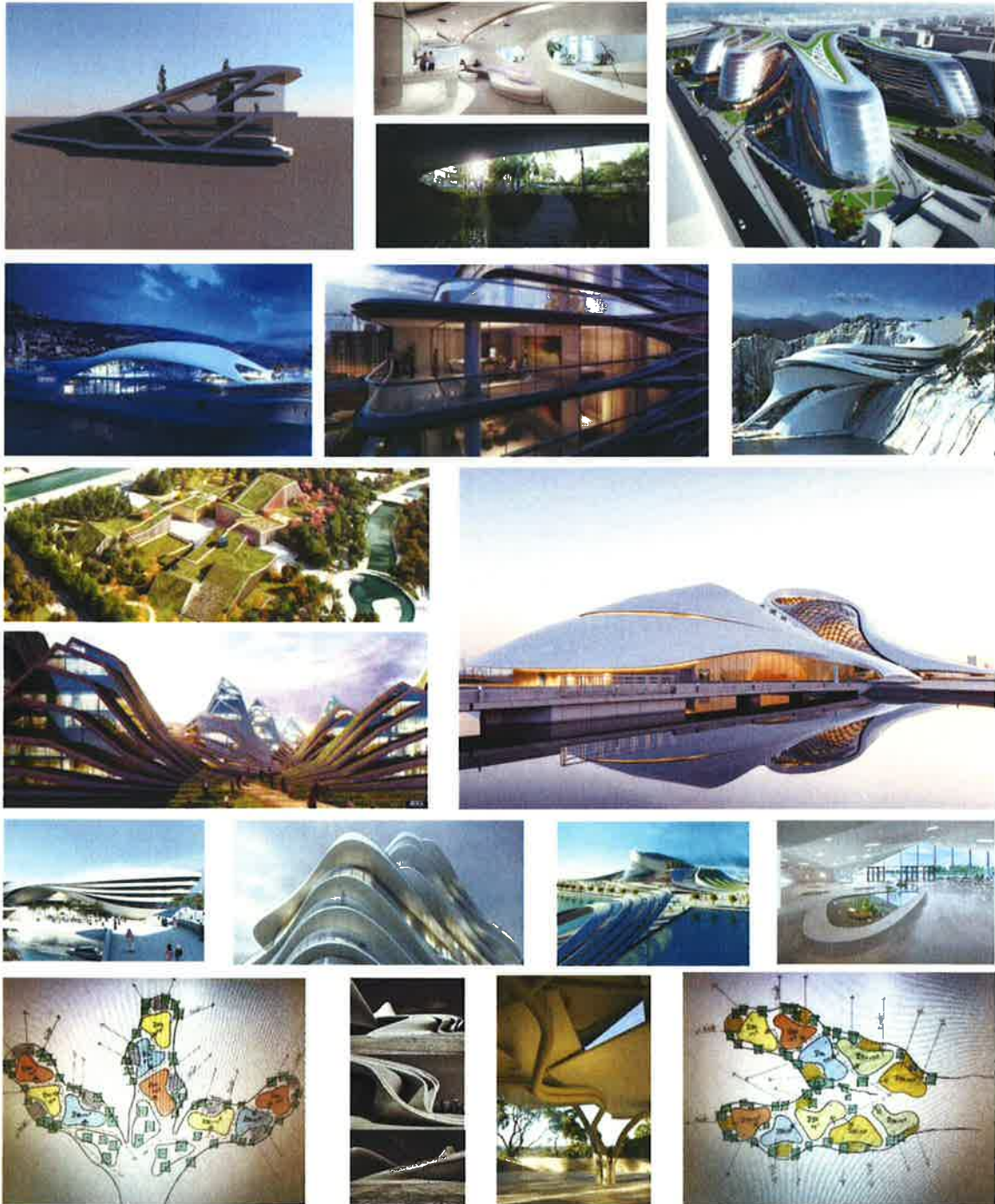
A final step is to make people, via the concept, more conscious of how their behaviors affect the environment and themselves and to change that for the better. That is why we want to connect the living-cocoon system with the houses of the direct neighborhood, in order to increase the system. We have the ambition that the living-cocoon system produces three times its own energy value, based on fully green energy production. This means that the complex contains 'over-energy', which can be delivered to the connected neighboring houses in the broader system. Households can acquire this energy at reduced rates, but only if they meet certain green conditions. They have to bring their organic waste to the bio-fermenter connected with living-cocoon complex, limit their in-house energy consumption, making ecological housing adjustments and cooperate in evaluation research. As such, they will change their behavior and experience the benefits, including saving money. In the future we can add some blue conditions as well. In the end, connected households are given the opportunity to acquire the fully developed green and blue innovations at a strong discount.

2) The first Quilty Earth concept: “La Fata Morgana”

Quilty Earth will develop various living-cocoon complexes with a special theme on unique locations all over the world. *La Fata Morgana* is the first project of Quilty Earth and will be realized in the municipality of Naarden ('t Gooi). The plot is located on a plateau which dates from the ice age. Millions of years ago, a glacier pushed the subsoil, which consisted of boulder clay, into several layers. This created the “Gooise moraine” and a glacial basin (a kind of pit). After the ice had disappeared, the plateau remained behind in the form of a large open area. This is still visible and covers more than three hectares of land. The moraine is now overgrown with trees, which has created a unique place over the centuries.



This forms the scenery for La Fata Morgana: a complex with 20 very luxurious and spaciouly designed living-cocoons (of 250 m2 and with a ceiling height of approximately 4 meters). Just as the ice has pushed the ground up in different layers, the complex rises from the plateau and is built up in different strata. The layers of sand in the ground are, so to speak, pulled up: the complex represents the layers that have developed over the centuries with an ice sculpture on top of it (the glacier). Each layer has its own shape and color and resides a number of living-cocoons. In nature, glaciers and soil layers change due to the ecological conditions and parallel to this phenomenon the green and blue innovations will change during their development process in the living-cocoons.



3) The structure of Quilty Earth

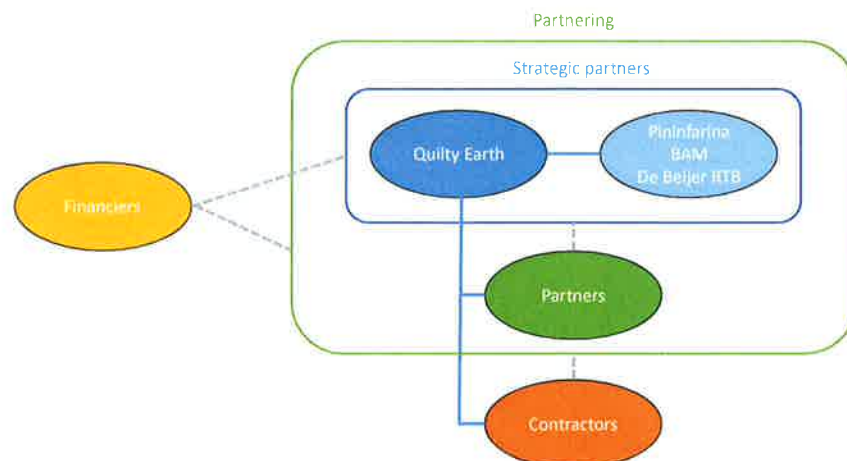
The Quilty Earth team is formed by the following members:

- Jerry Goossens - Goscom A.G. (initiator and concept developer)
- Tim Choy - Maradata (scientist and concept developer)
- Herman Bor - Contractor BTT (building coordinator)
- Gert Dral - Kuiper Compagnons B.V. (relationship- and contract management)
- Francesco Franchimon - BAM (blue technologies)

Each member of the team fulfills a certain role in the successful success of Quilty Earth concepts. In the course of time, the team will (possibly) be supplemented with new members who will fulfill other relevant roles.

Quilty Earth has currently three strategic partners: Pininfarina, BAM and De Beijer RTB. Pininfarina is an Italian design agency and famous for its car designs (Ferrari, Maserati, Alfa Romeo, etc.) and also design the living-cocoon complex (architecture). BAM will build La Fata Morgana and applies the latest techniques and innovations, including blue innovations and 3D concrete print. De Beijer RTB, in the person of Henk de Beijer (scientist and inventor), provides the main ecological innovation (energy generation) and connects other technologies to the central energy framework. Quilty Earth signs a formal cooperation agreement with its strategic partners.

Quilty Earth also contracts sub-partner who implement the concept. Companies that are interested in a sub-partnership and with whom Quilty Earth is in negation are: TNO (Combi PV&T building integrated generation), Alliander (energy network), Green Choice (energy supplier), Bartenbach (lighting), Octatube (glass technology), We Like Media BV (TV productions), Molteni/Dada (interior design), Strato Cucine (kitchens), Lema (wall systems), Holland & Sherry (interior upholstery) and fashionable designers and brands (e.g. Fendi, Louis Vutton and Julien McDonald). The latter will look in a more fashionable way to the living-cocoons. Furthermore, Quilty Earth also signs contractors who give input to the construction or maintenance of the living-cocoon complexes.



Quilty Earth contracts financiers to enable the implementation of the concept and the realization of La Fata Morgana. We get a first start by attracting the fortunate and famous. But we need additional funding for the further and longtime development of the innovations and the system as a whole. After all, the resident pays only once for the living-cocoon, but not for the continues development costs of the innovations itself. In turn, the resident accepts that he/she resides in a living-lab (although he/she will not or hardly notice).

Initially, we attract (European) green and blue funds to make the concept and La Fata Morgana possible. Additionally, we want to create a Quilty Earth community where people and organizations can connect to the platform and donate into a fund of our own. This Quilty Earth Donor Fund is used to stimulate blue and green innovations in the living-cocoon complexes. The donors can choose which technologies they want to support and they can monitor their development. In the end they also get information about its future green and blue impact and how they contributed to make the world a better place. We also ask all our (strategic) partners and contractors to donate and or to invest in another kind of way. Additionally, there will be a special Quilty Earth Investment Fund. Private investors can invest in the green and blue innovations and get return on investment, when they are commercialized.

4) Program- and projectstructure

Quilty Earth is executing a number of programs to realize La Fata Morgana:

1. Cooperation program
2. Realization program
3. Innovation program
4. Steering program

Ad. 1 Cooperation program

The cooperation program indicates how to realize and formalize the previously described structure. It results in the drafting and signing of a formal partnership between Quilty Earth and its (strategic) partners. These agreements also specify the frameworks for signing contractors and financiers, as well as how to scale up the technology for the commercial market and the final business model.

	Contracten	Verantwoordelijk	Start	Eind	Dagen	%	2017						2018					
							Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Blue Eco Samenwerkingsprogramma		1/7/17	1/6/18	240	4												
1	Concept SP overeenkomst	Jerry Goossens	1/7/17	1/8/17	22	20												
2	Rechtsperoon UE	Jerry Goossens	1/7/17	1/8/17	45	10												
3	Definitieve SP overeenkomst	Jerry Goossens	1/8/17	1/10/17	44	0												
4	Concept SW overeenkomst	Jerry Goossens	1/7/17	1/10/17	65	10												
5	Definitieve SW overeenkomsten	Jerry Goossens	1/10/17	1/6/18	175	0												

Ad. 2 Realization program

The realization program indicates which activities to undertake and what to acquire in order to build La Fata Morgana. This also involves the purchase of already existing eco-innovations, such as energy-generating asphalt (SolaRoad) for the driveway. A realization group will be set up for the realization program, including all people and parties who will prepare, execute and complete the construction. This group is managed by the building coordinator (Herman Bor).

	Activiteit	Verantwoordelijk	Start	Eind	Dagen	%	2017		2018				2019				2020				2021			
							Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2		
	Blue Eco Realisatieprogramma		9/7/17	1/1/21	910	7																		
1	Bestemmingsplan	Robert Slot	9/7/17	1/10/17	60	80																		
2	Bullenplans ontwerp	Robert Slot	1/8/17	1/1/18	110	20																		
3	Voorontwerp	Robert Slot	1/1/18	1/6/18	150	0																		
4	Definitief ontwerp	Robert Slot	1/6/18	1/1/19	153	0																		
5	Bouwoopbreiding	Herman Bor	1/1/19	1/3/19	44	0																		
6	Aanbesteding	Herman Bor	1/3/19	1/6/19	66	0																		
7	Bouw	Herman Bor	1/6/19	1/1/21	415	0																		

Ad. 3 Innovation program

The innovation program shows which innovative concepts are integrated in the building and how they continue to develop for both green and blue technologies. For the innovation program, an innovation group is set up with all the innovation parties in the partnership. This is managed by a program manager to be appointed in these technology areas. The program has a dual purpose: (1) enable technologies for product application in La Fata Morgana (i.e. the Quilty Earth concept) and (2) upscaling the technologies for the commercial market.

	Activiteit	Verantwoordelijk	Start	Eind	Dagen	%	2017		2018				2019				2020				2021			
							Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2		
	Blue Eco Innovatieprogramma		1/9/17	1/1/21	871	1																		
1	Conceptbepaling	Fienco	1/9/17	2/3/18	131	50																		
2	Systeemintegratie	TNO	1/1/18	1/1/21	785	0																		
3	Combi PV&T gebouw geïntegreerde opwekking	TNO	1/1/18	1/1/21	785	0																		
4	Warmte batterij	TNO	1/1/18	1/1/21	785	0																		
5	Elektrische batterij	TNO	1/1/18	1/1/21	785	0																		
6	Control & Ventilatie	TNO	1/1/18	1/1/21	785	0																		
7	Biovergister	TNO	1/1/18	1/1/21	785	0																		
8	Water	?	1/1/18	1/1/21	785	0																		
9	Risic	?	1/1/18	1/1/21	785	0																		
10	Gebouwbeheersysteem	?	1/1/18	1/1/21	785	0																		
11	Eco friendly business modellen	Fienco	1/1/18	1/1/21	785	0																		

1. Concept development

In consultation with its strategic partners, Quilty Earth determines the concepts in the green and blue innovation program (the above diagram lists possible innovations). In this phase it is discussed which concepts in the system to prioritize and prevail in relation to the architectural design or the aesthetics. The starting point is that La Fata Morgana gets a fully sustainable and self-sufficient energy system and that people get more vitality through well-being technologies. The generation of energy, electricity and heat will be fully integrated into the outer façade and into the infrastructural elements. Data analysis will be used for optimum performance, the exchange of energy with the environment and forecasting and preventing failures. As such, La Fata Morgana is working on a building that generates its own energy needs three times, giving it a negative CO2 footprint and making a positive contribution to the energy transition towards nearby residential areas. And with well-being technologies, La Fata Morgana is aiming to extend life expectancy by five years with a significantly higher quality of life ratio.

Preliminary design

Based on the results, the preliminary design can be made with a system concept version 1 (ready 1-6-2018). This shows the Q (heat) and E (energy) demand as a function of time. Based on this question, the energy system is based, as well as the first choice for adaptive walls, insulation, windows, solar heat, etc. The outcome of this is a Quilty Earth-La Fata Morgana version 1.0, in which some flexibility is maintained for possible changes. The engineers will also talk with the builders how to achieve this, resulting in a system concept for the constructors. In the preliminary design the estimated development costs of La Fata Morgana are specified.

Final design

On the basis of the preliminary design, the engineers and builders will further develop and concretize the concepts and the system. The builders ultimately determine the requirements and specifications for each partial function. This results in a definitive design, in which the actual development costs of La Fata Morgana are finalized.

Construction

During construction, the requirements and planning per function are specified and then carried out.

2. System integration

Herman Bor is working with an engineering firm to further integrate the concepts and elements in the system. This is a continuous process and will continue through to the end of construction. A program manager (to be appointed) will coordinate this process.

3. Combi PV&T building integrated generation

TNO develops within a European and Dutch project (including BAM and Akzo) a so-called “combi PV&T building integrated generation”: heat-win walls (smart facades). These can be integrated and further developed in La Fata Morgana. A starting point is for example to process solar panel elements in glass (windows). Furthermore, the energy consumption is minimized by positioning the complex (in relation to sun and wind), applying natural forms of shielding and using modern insulation techniques. Everything will be built from fully pre-integrated building elements (installations, PV, solar thermal, ventilation, etc.), which can be assembled in their entirety or in parts. By investing in adaptive construction, future developments can easily be introduced. In addition, the complex will consist as much as possible of natural (reusable) materials.



4. Heat battery

De Beijer RTB has developed a heat battery that can be further developed via Quilty Earth (to heat 20 living-cocoons about 20 GJ at m3 level is needed, which is currently not yet feasible). The heat battery thermos-chemically stores solar thermal energy, which can be used in colder periods to heat the house and provide hot water. In addition, solar heat can also be converted into cooling for warmer periods.

5. Electric battery

The aim is to also install an additional electric sea salt battery, which can be further developed in La Fata Morgana (partner still to be approached). This battery is suitable for stationary storage of, for example, solar energy, wind energy or temporarily storing electricity from the grid (electricity buffering).

6. Bio-fermenter

On an adjacent site, a bio-fermenter is connected to La Fata morgana to ferment organic waste from the neighborhood into biogas. This gas is converted into sustainable electricity and heat via a combined heat and power plant (CHP). A strategy will also be developed on how to involve the neighborhood and the municipality in releasing organic waste to the bio-fermenter. In addition, Quilty Earth is currently taking stock of Alliander to use so called “Jouliettes”: an electronic currency that enables private individuals to exchange generated renewable electricity (over-energy).

7. Water

Water will play an important role in La Fata Morgana. A minimum aim is greywater collection and reuse and a maximum aim to create clean (drinking) water and generate electricity/heat. Examples are to collect rainwater and purify it for drinking water or to recover waste water via a small heat pump or a large pump in the basement.

8. Sewer

La Fata Morgana also houses sewer innovations in its system. With the BAM, for example, an inventory is made to automatically monitor the medical health of the residents via the sewer system. In addition, nutrients can be extracted from the sewer to make fertilizer or biogas.

9. Control & Ventilation

In La Fata Morgana there will be a control and ventilation system, but it still has to be determined who will deliver and develop this. A basic principle of ventilation is to make the housing-pavilions dust-free.

10. Building management system

During the concept definition phase, a choice is made for a partner to develop the building management system (BMS), for example: Loxone, Siemens, Spectral or Enable-U. The BMS is used to centrally control (regulate) all technologies within the building and to let them communicate with each other. This system also collects and analyzes data presents its outcomes to the residents and developers (e.g. energy consumption). This represents the living lab function. The BMS consists of domotics (smart controls) and model predictive controls. Domotics regulates the integration of technology and controls in the building, as well as all kind of services into the building through internet (for example to manage audio, video, heating, air conditioning, alarm and other systems). With model predictive controls, the building also has a self-learning and self-correcting function (for example, automatically saving energy when the residents leave the house by switching off certain functions: light, heating, etc.). It is possible that "Jouliettes" can be linked to the BMS system in order to trade over-energy.

11. Blue technologies

The guideline for blue technologies is to follow the activities of the residents (sleep, hygiene, food, work) and what kind of sensing or other way of collecting data provides information to promote well-being and to prevent diseases. For example, improve sleep quality by performing sleep analyzes using intelligent mattresses, measuring the Body Mass Index (BMI) daily by using sensors in the floor, utilize intelligence mirrors for well-being dashboards and applying smart toilets that can analyze defecation for abnormalities.

12. Eco friendly business models

Within the innovation program, eco-friendly business models are also being developed to scale up and commercialize the technologies. For example, to translate revenues into eco-outcomes. This happens in brainstorming sessions within the core team and with specially invited third parties.

Ad. 4 Steering program

A steering group is formed by the concept developers (Jerry Goossen and Tim Choy) and the relationship manager (Gert Dral). This group supports the realization and innovation group in their activities and are responsible for the entire project organization. They approach (potential) partners, bring parties together, conclude the agreements and arrange financiers. The steering group also evaluates the process and the results in order to monitor progress, finances and goal achievement. In addition, there is also a soundboard group that facilitates and advises the steering group (as well as the realization and innovation group). Soundboard members are people with specific experience or a network that can be useful.

5) Business model

The projects gets return on investment through (co-)financing from (European) green funds, Quilty Earth Donor Fund, Quilty Earth Investment Fund, the sale of the living-cocoons, a percentage of the sale of successfully developed and commercialized eco-innovative products within the Quality Earth concept, the sale of over-energy generation and various promotional activities related to the concept (see also underneath).

6) Promotional activities

The Quilty Earth concept is promoted in various ways. The first aim is to make a documentary or TV-series from start to finish of the concept and beyond. A production company puts the entire process of design, delivery and further development of the building on film. It makes also recordings of how the building is designed and built, as well as how the residents interact with the green and blue innovations and other technologies. The production is sold (in advance) to a television channel, with preference being given to channels like Discovery Channel or National Geographic. All parties involved in the whole process are put on film (after permission), such as the concept developers, the participating partners, the municipality, the architect(s) and the builders. Promotional films are also made of the visual material that the parties can use for commercial purposes.

Quilty Earth sends press releases to (international) media about the general concept and La Fata Morgana. The concept itself and a most spectacular living-cocoon complex with the most innovative green and blue innovations is expected to receive a lot of exposure. Quilty Earth also informs political parties, provinces and municipalities about the concept and how it also can stimulate green and blue development in other regions.

The building contains a special exhibition space that can be used in consultation with the residents for presentations, seminars or other information meetings concerning green and blue innovations. The exhibition space has its own entrance, separated from the living area and its residents. The partners of Quilty Earth are given opportunities in the exhibition space to present their products and services to (potential) customers and stakeholders. After the presentation, invited guest can be guided into the building complex in consultation with the residents (some residents may want to give talks about their experiences with the green and blue innovations and show their home). The building and the living lab can therefore serve as a showcase. In addition, third parties who want to organize something about green or blue innovations (or other innovations for a better world) are offered the opportunity to rent the exhibition space.

Quilty Earth will develop a special website with information about the concept, the residential complex (La Fata Morgana), the participating partners, the green and blue innovations and the developments in the living lab. The website also has a page with a virtual reality image of the house. The visitor of the site can 'walk' through the house and view the innovative technologies. By clicking on the technology the visitor gets more information about the product and the developer. Quilty Earth accounts will also be created on Facebook, Twitter, YouTube and Instagram and a strategy will be worked out to promote the concept via social media.

