WELCOME TO THE GREEN VILLAGE

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TABLE OF **CONTENTS**

THE VISION	PAGE 1
OUR SUSTAINABLE GREEN MISSIONS	PAGE 3
SUSTAINABLE, LIVELY	
AND ENTREPRENEURIAL	PAGE 7
FUTURE LABS	PAGE 9
ENGINES	PAGE 13
GREENTECH STORE	PAGE 19
EVENTS	PAGE 23
THE VIRTUAL GREEN VILLAGE	PAGE 25
THE SHOWCASE	PAGE 27
WHAT YOU CAN SEE	PAGE 31
LOCATED AT TU DELFT CAMPUS	PAGE 39
THE COMMUNITY	PAGE 41
THE GREEN VILLAGERS	PAGE 43
THE GREEN VILLAGE CLUB	PAGE 45
THE GREEN VILLAGE INNOVATORS	PAGE 49
THE GREEN VILLAGE COUNCIL	PAGE 53
YOUR GREEN VILLAGE	PAGE 57

THE GREEN

"Creating a sustainable, lively and entrepreneurial environment where we discover, learn and show how to solve society's urgent challenges"

That is the Green Village vision; a vision that we want to realize at the TU Delft, in the economic heart of the Netherlands. Innovative power that sets horizons for a new, sustainable, green and circular economy is of vital importance.

The Green Village concept unifies clever, imaginative strengths of scientists and entrepreneurs and turns ideas and visions into experiences and commercially viable products and services.



SUSTAINABLE SUSTAINABLE GREEN SUSSIONS

We want to develop and create a sustainable environment. This huge challenge shows us the direction, but what is a sustainable environment? We have formulated the following four missions that we believe are the cornerstones towards such a sustainable, green environment. These missions show us the direction how to realize a sustainable environment. Missions that develop in time, that can be addressed with many technologies, services and systems, and that we will deal with in an entrepreneurial way.

THE GREEN VILLAGE MISSIONS

4

CLEAN ENERGY PRODUCER	Energy efficient Green Buildings Electric transport Clean Lighting systems Smart heat grids Smart DC electricity grids
WASTE AS RESOURCE	Re-use and recycling Material production from waste Circular products Circular buildings Smart waste grids
CLEAN WATER PRODUCER	Water efficient Re-use of waste water Produce from rain Produce with fuel cell Smart water grids
CLEAN AIR PRODUCER	No CO ₂ emissions into the air Reduction of fine dust in the air Removing NOx from the air Production of oxygen

Each mission provides huge challenges, and requires a lot of research, development and innovation. We will not only study these topics. Above all, we want to 'realize' them in a working environment, starting the Green Village 'experiment'. A Green Village that will never be finished, will change over time and in the end will be a temporary settlement.

The Green Village will be an inspiring place, a living lab, where innovations and new developments will never stop. A dynamic place where scientists, students and companies work together to realize the sustainable green solutions for our world's future.





THE GREEN

The Green Village will be a lively, green and visible area where scientists and students meet entrepreneurs, innovators, companies, artists, teachers and vou. An area with amazing possibilities, technologies, products and systems that will contribute to a green environment. An area where you will meet likeminded people either in the restaurant or lunch room, at exhibitions, in workshops or at events. You can walk around and be informed about what is going on. There are working places where you plug in and be connected to the world as well as areas where you can work together with scientists and companies on the technologies and systems of the future. An area where open source data are available for everyone, where you can follow open courses and where there is an open environment for innovation. The Green Village at the TU Delft, in the economic heart of the Netherlands is an ideal place to bring together leading scientists and innovative companies. You can go to the store to make your own products, apps and design your own systems. Finally, you can even become a member of the Green Village community; become a real Green Villager.



The Future Labs will show you the cutting edge of technology and system developments. Scientists, students and companies work together to solve some of the most urgent challenges. Challenges which can only be solved through real paradigm changes. At the start, we will open three future labs. But be our guest if you wish to open your own future lab with a ground breaking paradigm changing concept.

The Green Village will be realized using these new paradigm changing concepts. By applying these new technologies, systems and concepts, the future labs will be the place for system research, using data from the Green Village.

•LED will be applied in the Green Village as lighting system integrated in products, furniture, walls, floors, windows and even in clothes. It will create a smart environment as LED will be used as a screen that can show you information. But LED will also be used as a sensor and for communication and information transfer. And finally, we will even print LED's, integrated with a 3D printer, to make the most amazing LED products.

•A DC electricity grid will distribute the electricity throughout the Green Village. DC grids will be applied in the buildings and on street level, connecting all supply and demand. Solar modules will directly connect to the DC grid, no invertor will be needed. Batteries will be charged directly with DC and all appliances will be directly fed with DC power. 9

New smart control strategies, safety concepts and grid architecture will be designed and applied.

•The fuel cell car will be applied in the Green Village, of course for transportation. However, the fuel cell will also be part of the electricity and water production systems. The fuel cell will produce electricity, clean water and, in the reversed mode, maybe even H_2 . In addition, conversion from gas, biogas, electricity into H_2 will be part of the Green Village technologies. Of course storage of H_2 is needed in order to fuel the tanks of fuel cell cars.

THE GREEN VILLAGE FUTURE LABS

LED REVOLUTION	 Present lighting system < 1% efficient LED factor 4 more efficient technology LED can reduce distance between light production and consumption LED is dynamic and interactive LED creates new products and services 	
AC-DC	 All appliances and future electricity production is DC, but electricity grid is AC DC grid is more energy efficient DC grid gives less invertor costs DC grid uses less copper DC grid generates no electro-magnetic radiation 	C C C C C C C C C C C C C C C C C C C
CAR AS POWER PLANT	 While parked fuel cell cars can generate electricity more efficient than the present electricity production system Fuel cell cars have an efficiency of 60% Cars are only used for 7% of the time Car engine is about 100 kW which can produce the electricity for 100 houses Every year, worldwide, we buy twice as much electricity production capacity as is in total installed as power plants for electricity production 	

Each of these future labs needs a clear goal, a dot on the horizon, a future perspective. We have developed the following three futuristic systems.

THE GREEN VILLAGE FUTURE LAB "DOT ON THE HORIZON"

LED REVOLUTION	THE HARP Wind turbine, solar cells combined with shops, restaurants, meeting rooms a discotheque and cinema. LED is everywhere. On the outside of the building for advertising purposes. Under the net as a large cinema. LED is integrated in every object. http://youtu.be/ljAGyOqG4cU	
AC-DC	THE ENERGY WALL Integrated in the wall are solar cells, small wind turbines, LED for lighting and signaling, electromagnetic wires to reduce fine dust as well as a public transport system. All systems will be connected through a smart DC grid	
CAR AS POWER PLANT	CAR PARK POWER PLANT A car park for about 500 cars, where fuel cell cars can be automatically parked and be connected to the electricity, water and H ₂ grid. The fuel cells can produce electricity, heat and water while parked. In this manner, cars will leave the car park with a full tank http://youtu.be/q-q0N-OixMo	

The Green Village has to practice what it preaches, it must be a really sustainable Green Village. Thus, the Green Village will be realized as a living and ever changing village. Our dynamic Engines will be the core to realize this Green Village. They provide the GV with a certain flow, such as electricity, heat & cold, water and fuel. Or they collect certain waste "flows" and treat them, such as solid waste and waste water. The Engines consist of three elements, they each have a "heart", "veins" and "lungs". The heart contains conversion, cleaning or storage equipment inside a building. The veins transport the flow over to the Green Village: to and from the heart. And the lungs collect the sustainable sources such as solar, wind biomass, movement, air and waste from the environment.

There is one special Engine, the Cockpit. The cockpit engine has the brains, nerves and senses necessary to monitor and control the Green Village

Ultimately, we will organize the Green Village system into 10 engines that each will have their own specific function,

but interact with the Green Village and with each other. The technologies in each of these engines will change and can expand over time. The goal is to produce all the necessary sustainable energy and water in the Green Village. As for the waste streams, we want to process these in the Green Village into useful new products, materials and energy. At the same time we want to fuel our cars with electricity and/or hydrogen.

14

The heart of the Engines will be placed in transparent buildings so the viewer can see for himself what this heart is made of and how it works. Each of these Engine hearts has input flows and output flows. The input flows could come from outside the Green Village, or from other engine hearts or via the veins from the lungs. The output flows will be distributed through the Green Village via the veins, will be input for other engine hearts or will be transported outside the Green Village.



The veins throughout the Green Village will be placed in three transparent ducts. These ducts are easy to access and each vein can be easily replaced or removed and new veins can be added as well. Robots and sensors will inspect and repair the veins in these ducts.

- Electricity Ducts contain all AC and DC cables and all data cables
- Water Ducts contain all water pipelines; drinking water, hot and cold water, rain water, etc.
- Waste Ducts contain all waste water pipelines for grey, yellow and black water, with a vacuum pipeline to collect public waste, etc.

THE GREEN VILLAGE ENGINES

ENGINE	Flow	Heart	Veins	Lungs
ELECTRICITY	DC Electricity	AC/DC conver- sion, CHP, fuel cell, batteries,	AC and DC grid	Solar, wind, biomass, movement
CLIMATE	Heating and cooling	Boilers, storage tanks, absorption cooling,	Hot and cold water grids	Solar and ambient temperature
H ₂	Hydrogen	Steam reforming, electrolyser, storage H ₂ ,	Hydrogen tanks and pipelines	Electricity and (bio)gas
Water	Drinking water	Rain and grey water cleaning, fuel cell water production, storage tanks,	Drinking water, rain water pipelines	Rain
Waste Water	Grey, yellow and black waste water	Digester, struvite production, digestate storage,	Grey, yellow and black water pipelines	Urine and faeces, kitchen waste, organic waste
Organic Waste	Digestate treatment	Grow food, algae on digestate, convert to fertilizer, pellets,	Digestate pipeline	
Waste	Solid waste; plastic, paper, glass, batteries, coffee pads,	Storage containers, plastic recycling, re-use materials,	Vacuum pipeline and bin transport	Solid Waste
Electricity Fueling	Electric transport fueling	Electric vehicle shop, electric fast & normal charging, battery charger,	AC and DC electricity grid	
H2 Fueling	Hydrogen transport fueling	Hydrogen storage, compressors, fueling station,	Hydrogen tanks and pipelines	
		Brains	Nerves	Senses
Cockpit	Monitoring and control	Servers, computers, data base,	Data cable and wireless	Sensors at all flows

These engines will develop over time; as new technologies can be added or technologies and systems will be changed. Integration with 'waste' products from other engines will develop. And finally we will want to achieve an integrated, sustainable system, where we have realized a truly sustainable and circular system. As an example the changing development over time for the Electricity Engine Heart is shown here:





GREENTECH

The Green Village is not only meant for research, to walk through or to be amazed by The Green Village is a place in which you can participate. You can see and learn for yourself how everything works, what research is going on or what everybody is doing. However, that is the passive way. We want you to become an active member: design and make your own products, services and apps; conduct your own experiments, perform modeling and testing and be part of the total Green Village experiment and open innovation system. The GreenTech Store offers you a new concept in shopping. Not just passive buying, but actively design and 3D print your personalized products. It is not about accepting the standard design and its functionality, but designing and developing your own products, systems and apps. You can actively design and dimension your own sustainable energy systems, LED lighting schemes, home automation systems, solar systems, your electric mobility or even your smart DC grid. In addition, a crowd funding facility will be part of this new GreenTech Store concept.

Starting with 3D printing and LED electronics we will organize in-store courses such as "How to work with a 3D printer", "How to design your own LED lighting system" and "How is the Green Village developed and build".

THE GREEN VILLAGE GREENTECH STORE

START

20

GIFT-BRAND ARTICLES	Buy or make your own small Green Village brand articles with LED, PV, piëzo electric
(TOURIST) INFORMATION	Apps-Books-Content about the Green Village and TU Delft
3D PRINTING	Design and print your own products. (Plastic) waste will be the resource
LED	Design and build your own LED lighting system. In future even print your LED lighting

FUTURE	
HOME AUTOMATION	Design and develop your own energy monitoring and home automation systems
APPS	Develop your own apps, use the GV open source data
PARTNER	Green Village partner companies can show, demonstrate and sell their new green products and services
COMPARE	Compare products you want to buy on total cost of ownership that includes price and energy costs
ENERGY SYSTEM	Design your own energy system, LED, home automation, solar, electric mobility, smart DC grid, heating and cooling
CROWD FUNDING	Invest in brilliant ideas, concepts or startup companies or make your ideas available for others to invest
WHAT ELSE?	Design and make your own robot, design your water system, design and build your own electric vehicle



22

THE GREEN VILLAGE EVENTS

EXHIBITIONS	GV Tours, LED, Solar, Fuel Cell Cars, Energy Storage, Waste Water Treatment, Clean Water production,
EXPOSITIONS	LED art, History of Light, Solar Art, Waste Art, Wind Music,
CONFERENCES	DC-Electricity, Energy Efficiency, Hydrogen, LED, Circular Economy, Solar Design,
WORKSHOPS	Company, brainstorm, co-creation, innovation, workshops, bootcamps,
MEETINGS	Board, shareholder, club, meetings,
COURSES	GV weekly lectures, GV MOOC's, Courses about energy, water, waste, air,
FESTIVALS	All Energy Day, We beat the Mountain Day, Green Villagers Day
GV GAMES	LED design, Green 3D printing, Green Apps Design,
GV TV	GV GreenTech Show, GV Talk Show, Youtube GV GreenTech exploration,
COMPETITIONS	Electric Pizza Courier, Formula Zero, Solar, Segway,
SHOWS	Sustainable Dance Event, LED dance shows, GreenTech fashion,

The Green Village is a public space, you can walk through the village, get a Tour and discover the green technologies of the future. You can drink a cup of coffee, have lunch or dinner in the Green Village restaurant, served by a robot maybe. You can get a working place in an inspiring environment or you can organize a business meeting. You can visit the future labs to see and experience the future paradigm changing new technologies. And in the GreenTech Store you can design, make and buy your personalized products.

Not only a nice place to visit, we will also organize events; exhibitions, shows, contests, workshops and conferences. The Green Village will create an atmosphere where interesting and amazing events will take place. We can think of LED art exhibitions, LED gaming events, sustainable dance festivals, "We beat the (waste) mountain day", DC smart grid conferences, electric pizza courier games, formula zero games, solar races, The Green Village TV (GVTV), or the All Energy Day. The Green Village will organize some of the events, but students, organizations or companies can organize their own green events in the Green Village as well.



O THE VIRTUAL GREEN

You can visit the Green Village in real life at the TU Delft campus in the Netherlands. But you can also visit the Green Village online where you can have a virtual walk through the Green Village and be informed about the future labs, engines, events and activities. You can even join some of the events, via webinars, virtual event rooms or virtual exhibition tours. It is also possible to visit the GreenTech Store. Here you can virtually design, make and buy products, services and energy systems. In addition, there will be a crowd funding facility, where you can invest in brilliant ideas, concepts or developments or put your own ideas up for funding. All data from the Green Village is available and can be used online in the cockpit engine. And, of course, there will be open courses and master classes which you can 'attend'.

At the entrance of the virtual Green Village you can select a character. In fact, you can walk through the Green Village as a student, business man, teacher, politician or artist, all the while getting comments from these characters. Follow these characters in the social media, have a look at the Green Village TV channel showcasing the adventures of the Green Village characters. Have a look at:

www.thegreenvillage.org and start a virtual tour.





THE GREEN

The Green Village will be built as a temporary village, possibly for a period of 5 to 10 years. The Green Village will grow and change over time. It will be a place where you can view new technologies and systems. You will be able to take a tour through the Green Village and be amazed about all possibilities, new technologies and green solutions.

The Green Village will be built based on the principles of the circular economy. All materials and equipment will be owned by a resource company. This company will eventually take back all materials and re-use them in other projects or products. The Green Village will only pay for the use of these materials.

THE GREEN VILLAGE BUILDINGS

SPACE	PURPOSE	WHAT
FUTURE LABS	3 Future Labs, LED revolution, AC-DC, Car as Power Plant. Each Future Lab has work place for the system researchers and exhibition areas to experience the paradigm change. Also specific related organizations can have their offices in the Future Labs.	15 work places in each Future Lab -LED exposition space -smart DC grid design center -fuel cell car showroom
ENGINES	10 Engines will provide the GV with a certain flow, such as the electricity, heat & cold, water, fuel. Or collect certain waste flows and treat them, such as solid waste and waste water. The Engines consist of three elements, they each have a "heart", "veins" and "lungs". The Cockpit Engine will process all data.	10 Engine heart buildings at the Engine Square
STORE	4 Store Squares at the start: to buy GV gift and brand articles, to get information, 3D printing and LED lighting. You can design, make and buy products with 3D printing, design and develop your own LED lighting system and get a course how to do this.	4 Store Squares around a coffee corner
EVENT CENTER	In the Event Center it will be possible to organize all kind of events; conferences as well as sustainable dance festivals. Board rooms and meeting rooms where you can hold board room meetings, give courses training or workshops. Both physical as well as virtual attendance is possible. And of course the Hall of Fame will show the GV brilliant ideas, products, scientist and companies	200 people event area with -Bar -Coffee corner -2 board rooms 20 people -3 meeting rooms 30 people 8 work places 3 Hall of Fame exhibition rooms
RESTAU- RANT	You can have a 'green' lunch or dinner. Fresh local products, prepared in an energy efficient way and with minimum of waste. Robots will be part of the hospitality team.	120 guests restaurant area Open kitchen Food storage and preparation Greenhouses on top
OFFICES	The Green Village team, the Delft Energy Club and the Delft Energy Initiative will have their offices here. Everyone can hire a flexible work place in the Green Village, from small companies to temporary project organizations. You can use all facilities but also connect to the Green Village open source data base for testing and/or developing your own apps.	30 people GV offices 10 people GV media offices 7 people Delft Energy Club 8 people Delft Energy Initiative 15 people Other TU Delft 30 people Seats to Meet Coffee Corner Meeting area





>> WHAT YOU >>>>> CAN SEE () () ()

The Green Village will host the Future Labs, the Engines, the GreenTech Store, and an Event- and exhibition area with a restaurant and lunchroom, Offices for the Green Village staff, but also flexible working places and of course sufficient space to organize courses, workshops or meetings. The Green Village will also contain all the green energy and water production facilities, such as solar modules and small and medium sized wind turbines for electricity production, solar vacuum tube collectors for hot water production and rain water collectors to catch rain water. And, of course, you can park your electric or fuel cell vehicles and charge the batteries with electricity or fuel your tank with hydrogen.

THE GREEN VILLAGE PUBLIC SPACE

SPACE PURPOSE

WHAT

Square and streets	A large square for hosting outdoor events will be realized in the GV. The square will contain outdoor furniture, a solar fountain, e-fitness equipment, LED lighting system, LED information and guiding.	300 people on square
Traffic lanes	Traffic lanes will be present for all kinds of electric transport, automated freight transport, personal electric transport by e-bikes, Segway's, etc. Cycling lanes and walking lanes will be present. No cars are allowed within the Green Village.	Cycling lanes Biking lanes Electric personal transport lanes Electric freight transport lanes
LED lighting	Outdoor LED systems will be installed and integrated in floors, walls and even outdoor furniture. LED will be the lighting system, it will inform you, guide you through the Green Village and there will be an outdoor cinema. But LED will be also your communi- cation and social interaction device.	In all public outdoor elements LED lighting integrated Everybody will have his personal LED in the GV
Solar Energy	Solar modules for electricity production will be placed on the roofs of all buildings and in the open space (on separate constructions). On the south walls of the buildings solar vacuum tube collectors will be installed for hot water production.	In all public outdoor elements LED lighting integrated Everybody will have his personal LED in the GV
Wind Energy	A medium sized wind turbine of 50 kW, 30 m hub height and 18 m rotor diameter will be placed as a temporary facility.	Medium sized wind turbine in center GV
Rain water	Rain water collection devices will be placed in the open space to collect rain water and process this to drinking water.	1000 m2 rain water collection by umbrellas

The Green Village is a group of temporary structures, built for a period of 5-10 years. All technologies will be made visible. You can see and learn about:

•The Green Village electricity infrastructure. Both outside and inside the buildings there will be DC, Direct Current. All appliances will be connected directly to the DC grid. Inside the buildings the main voltage level will be 350-400 Volt, but also a micro grid, where you can plug in USB to charge equipment directly, will be part of the system. Plugs, sockets, safety and control systems for this DC system will be especially designed and developed.

•Floors inside buildings as well as roads and pavements outside the buildings need to contain the infrastructure ducts and many technologies. LED lighting will be used in and outside the buildings, induction charging in and outside the buildings, low temperature heating systems in the buildings, solar collector outside the buildings, robots to control, clean and maintain, integrated also in the floor. Therefore we want to build the Green Village on a raised platform. Underneath this platform we can put all the infrastructure ducts and technologies we want, easily accessible and visible, The LED lighting system will be totally integrated in floors, walls, in products and in furniture. The outside walls of buildings and the pavement will contain LED lighting, which can show you the way or provide you information through large LED screens.

The LED's will be used as sensors, they will show you the way out when there is a fire and/or guide you through the Green Village during a Tour.

•All appliances will be very energy efficient. Each individual appliance will be monitored and can be controlled by the Green Village automation system. New types of appliances, such as the Smart OLED window, robots, electric transport, wireless products with induction charging, will be shown. And maybe even the one minute (microwave) egg cooker will be on view.

•The water-using appliances such as showers, water taps and toilets will be very water-efficient. We will use vacuum toilets where urine will be separated from feaces. We will use low water consuming shower heads and water taps. Cooking will be done using energy and water-efficient steam ovens. And we will re-process the grey water to drinking water again, as we will do with rain water.

•Rain water will be collected throughout the Green Village and will be processed to quality drinking water in the Water Engine heart.

•Electricity production in the Green Village will be provided by energy floors and fitness equipment activated by and through your movements. Solar modules and small- to

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medium-sized wind turbines will produce electricity. Different solar systems will be used, on the roofs of buildings, but also in the open spaces. A medium sized wind turbine which can be moved easily, will become the landmark of the Green Village.

•Hot water will be produced through vacuum tube solar collectors, which will be installed at the south wall of all buildings. The hot water, combined with very efficient heat pumps, will provide hot water for showers, dishwashers and washing machines as well as for all the coffee machines. But hot water is also used as the main source for heating the buildings. The heat can be stored temporarily in the phase change of materials.

•Throughout the Green Village sensors will be installed to measure not only the air quality, but all energy, water and material flows, from the presence and behavior of people, to transport devices and robots. These data will be made available in an open-source urban data base. Anyone can use these data for research, testing or design purposes or to develop apps.

36

•Electric transport with Segway's, bikes, scooters, small cars, or your own vehicles designed by yourself. The Green Village will offer charging, renting and assembling facilities for all electric modes of transport.

•One of the paradigm changes is the car as power plant. This implies that we use the fuel cell in the car to produce electricity, hot water and clean water while the car is parked. Such an idea may seem simple but there are many items needing further research, engineering and testing. In the Engine Hearts we will install fuel cells to produce electricity and water for the Green Village. In other Engines we will produce H_2 from gas, biogas or electricity. And we have an Engine Heart in which we produce & store H_2 , and compress it in order to fuel the tank of a fuel cell car.

•You will be amazed when visiting the Green Village; robots will serve you a cup of coffee, you can boil an egg in 1 minute, LED will show you the way, a vacuum tube elevator will transport you to the top floor, you can 3D-print your own products. Aside from all this, companies can use the Green Village to show their future products and services. And you can learn something or follow courses; all the way having fun.







LOCATED AT TU DELFT ③ ③ CAMPUS 「

The Green Village will be realized at the heart of the TU Delft campus. The Technical University Delft is one of the oldest universities in the Netherlands, founded in 1842 by King Willem II of the Netherlands. The University hosts 8 faculties: Aerospace Engineering, Applied Sciences, Architecture, Mechanical-, Maritime- & Materials Engineering, Civil Engineering & Geosciences, Electrical Engineering, Mathematics & Computer Sciences, Industrial Design Engineering and Technology, Policy & Management.

With over 19,000 students, more than 3,300 scientists and over 2,200 people as support- and management staff, it is the largest technical university in the Netherlands.







THE GREEN

The Green Village is not only a physical place you can visit or walk through. Both the Green Village and the virtual Green Village will offer you the possibility to join and to contribute to the future development. We want to make it a living community. Everyone can become a partner. A real Green Village member, a Green Villager. Companies can join the Green Village as a member of the Green Village club. And both researchers and students can join the Green Village as a Green Village innovator.

The Green Village must be a place and community for everyone, developed by everyone. From all over the world you can visit and experience the virtual Green Village. We want ideas from students, scientists, companies, organizations, artists and especially from YOU, to develop the green future for everyone. Provide us with your ideas and thoughts and become a Green Villager, a Green Village club member or a Green Village innovator.

And, of course, we want the Green Village community to participate in the future decision-making process. We will install a Green Village council in which representatives chosen from the different groups will advise the TU Delft board.





The Green Village is a living village, where new future labs, activities, buildings, systems, technologies or concepts will be implemented over time. The Green Village will grow and change continuously. But it is not the Green Village organization that is leading this change. We need the innovative power of everyone, the crowd, you as a Green Villager, in order to be able to solve society's urgent challenges.

Everyone can subscribe as a Green Villager and will be informed about what is going on in the Green Village, the progress in the future labs, the event calendar, the new products in the store and many other items. The virtual Green Village will be the place to be; as here you will be able to find all relevant information. You can become a Green Villager gold member and get even more in-depth information, have access to the extended Green Village open-source data base, get discounts in the GreenTech Store, be able to design and print your own 3D products or your own apps, get discounts for events and exhibition tickets or join in organizing on-or offline events, youtube, facebook, twitter or linkedin activities.

And we will ask every Green Villager to donate his or her brilliant ideas, innovative products, technologies or services to the Green Village. All these items will be published and every year all Green Villagers can vote for the most interesting item that has been donated to us. The top ten items will be included in the Green Village hall of fame.

The Green Village -on and offline- is a meeting place and community where researchers, students and companies can meet each other and work together to research and develop the new innovative green technologies, services and systems of the future. Companies wanting to be involved in this open-source innovation network can become a member of the Green Village Club. They can take part in research and innovation projects, can test their products, services and systems in the Green Village. Companies can advertise and sell their new products in the GreenTech Store, become a partner in one of the future labs or organize innovation challenges. They can organize meetings in the Green Village, get exposure in the on- and offline Green Village, or organize events. Companies can make use of a dedicated crowd funding platform. And the Green Village companies get access to the Green Village community; students, researchers, Green Village companies and the Green Villagers.

THE GREEN VILLAGE CLUB

FUTURE LAB	Join the research and development program in one or more of the Future labs to be at the front end of the technology and system innovations.
INNOVATION	Use the Game, the Green Village open source database, the future labs, the store and engines as tools and the Green Village as an inspiring place to develop new, innovative products, services or systems.
TEST	New products, services or systems can be tested in the Green Village, a real-life system environment
SALES	In the GreenTech Store new products, services and systems can be advertised and sold. The Store can be used to test the market.
MEETINGS	Board meetings, sales meetings, workshops, seminars or brainstorm meetings can be held in the Green Village
EVENTS	Companies can organize their own events, exhibitions, shows or competi- tions in the Green Village,
EXPOSURE	Advertising and marketing your company, products or services via place- ment in the Green Village, the GreenTech Store and the virtual Green Village.
CROWD FUNDING	The Green Village will offer a dedicated crowd funding facility for develop- ment and sale of new products and services, or even to start your own proj- ect, company or organization.
STUDENTS	Meet or get introduced to dedicated and brilliant students and organize seminars, master classes or just a drink in the Green Village to meet them.
GREEN VILLAGERS	Get access to the Green Villagers community and use this community for market information, consumer preferences, crowd sourcing, etc.
WHAT ELSE?	Organize your personnel day, your shareholder meetings or celebrations in the Green Village. Meet other Green Village companies. The possibilities are endless!



One of the tools the Green Village will offer companies is the Game: to develop new ideas, innovative products or services. The Delft Energy Club, a student organization at the TU Delft, has developed this interactive internet application. The Game gives a specific group of people (employees of the company, the Green Villagers, students of the TU Delft) an opportunity to put forward new ideas and concepts, and this group of people can also invest in what they believe are the most interesting ideas and products.

Every year we will organize a Green Village company contest. We will ask the Green Village companies to put forward there most innovative, green product, system, technology, service or project. All Green Villagers can vote and the top ten will be included in the Green Village hall of fame



THE GREEN

The Green Village wants to solve society's urgent challenges. This is only possible when scientists and students offer their combined brainpower and do research. We organize some of the research in the future labs at the Green Village. But it is also possible to use the open-source data base of the Green Village for your research. Or even use the Green Village environment for testing or research purposes. In addition, there will also be many researchers and students from all over the world who perform brilliant research into these topics.

We want to build a Green Village research community



where we can share and discuss our insights and findings. The Future Labs will organize conferences, seminars, courses, MOOC's, exhibitions, etc. with respect to their topic: LED revolution, AC-DC and the Car as Power Plant. We will start the Green Village Journal and once a year we will organize the Green Village Conference to meet each other, present our research and to discuss about the Green Village future.

The Delft Energy Club will have their offices at the Green Village. They will organize all kind of events, lunch lectures, energy challenges, sustainable dance events and, of course, their yearly All Energy Day.

Every year we will organize a Green Village innovator contest where we will ask the Green Village researchers to put forward their most brilliant articles, essays, papers, reports, products or patents. All Green Villagers, Green Village companies and Green Village innovators can vote and the top ten will be included in the Green Village hall of fame.





MARINE GREEN VILLAGE ♪↓♪↓ ⊗ ⊗ COUNCIL ⊗ ⊗

It goes without saying that the Green Village community needs to participate in the future decision making process. Green Villagers, Green Village companies, Green Village researchers and students, they all contribute to the Green Village and therefore we want to hear your voice. We will install a Green Village council where every year one or more representatives of each group will be elected. The Green Village council will act as a supervisory board. Budget, strategy, major new activities, annual accounts, major investments or changes will be discussed and brought to the shareholder of the Green Village, the (TU Delft and others) for approval. The Green Village board will prepare the meetings of the Green Village council. And the Green Village board will also prepare yearly elections.





THE GREEN VILLAGE GREEN VILLAGE COUNCIL

REPRESENTATION	NUMBER	TIME
GREEN VILLAGERS	2	2 years, every year one elected
GREEN VILLAGE COMPANIES	4	2 years, every year two elected
GREEN VILLAGE RESEARCHERS	2	2 years, every year one elected
DELFT ENERGY CLUB	2	2 years, every year one elected
TU DELFT COMMUNITY	2	2 years, every year one elected
HALL OF FAME, THE MAJOR	1	1 year, every year elected

The Green Village will install a Green Village ambassador team. They will help us to promote the Green Village. The Green Village major will be elected every year and will represent, online or offline, the Green Village at events, ceremonies and invitations. The mayor of the Green Village will be supported by the Green Village ambassadors to promote the Green Village worldwide. The mayor of the Green Village will be elected from all the new entries that year in the Green Village Hall of Fame. Every year a Green Village inauguration festival will be held to install the Green Village council and the new mayor.



THE GREEN

"Creating a sustainable, lively and entrepreneurial environment where we discover, learn and show how to solve society's urgent challenges"

The Green Village is a living and ever changing village, both physical and virtual. We want to create an environment and atmosphere in which everybody is welcome to participate, give comments, develop or test new products, organize events, make and buy personalized products, learn about sustainable technologies and systems or build their own community. We do not have all the answers, we cannot possibly solve all the urgent problems ourselves, and we simply need you. So become involved in our Green Village community: together we can realize our vision, our dream.



About the author

Over the years, prof. Dr Ad van Wijk (1956) has played an important role in the development of renewable energy in the Netherlands and beyond.

In 1983, after completing his physics education at Utrecht University, he started a research group there in renewable energy and lead it for more than 10 years. He obtained a PhD in 1990 on the subject of windenergy.

In 1984 he co-founded Ecofys, a renowned energy policy and -technology consultancy. From this basis he establised Econcern, a group of companies active in poject development, product development, -production, -construction and services in renewable energy solutions.

Econcern developed the Dutch offshore windfarm Prinses Amalia, large solar parks in Spain and a biomethanol factory in Delfzijl. Econcern also developed innovative energy systems like the Closed Greenhouse, the Quicc elektric vehicle, off-shore windturbine Darwind and the Energy Mirror that visualizes the energy use in offices.

Econcern was among the fastest growing companies in Europe for several years, employing 1200 people in over 20 countries. The company and its founder won several awards, both in innovation and entrepreneurship. In 2007, Ad van Wijk was awarded Dutch Entrepreneur of the Year.

In 2009, the financial crisis hit Econcern - the main cause for its bankruptcy. All group companies however were taken over and continued by other companies and investors.

Currently, Ad van Wijk is a part-time professor at Delft University of Technology, on the subject area Future Energy Systems. In parallel, he is a renewable-energy entrepreneur and strategy advisor to several companies.