MAASAICA

DESIGNED BEYOND MOBILITY

ERIK MELLDAHL - UMEÅ INSTITUTE OF DESIGN 2014

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INDEX

1 ABSTRACT

The automotive industry is conservative and doesn't take enough responsibility in emerging markets. Thus, countries such as China and India have experienced huge problems with pollution as they have increased their living standards and entered the western consumption society. In these booming economies there are still people who live their lives according to old customs, in small sustainable societies. It is also they who suffer most from the ongoing urbanization. Hence the automotive industry should rather adapt to their cultures than let these people adjust to the consumption society.

Now, imagine a third industrial revolution where sustainable energy and manufacturing set the standards for production. Africa is then in the forefront when it comes to alternative and sustainable solutions. Maasaica is a concept from BMW which is locally built in Serengeti using 3D printing technology, degradable materials and traditional handcraft.

''When you take on something like your footprint on the environment, you have to say,
'Where am I going to draw the circle around my level of responsibility
and then where do I assume that others will take responsibility?''

Sally Jewell, United States Secretary of the Interior

2 INTRODUCTION

2.1 MY MOTIVATION

As designers we have great possibilities to effect the final result early in the process and come up with sustainable ideas, which in the end can change the world. It is an opportunity we should make the most out of and always keep in mind when designing.

By combining my great interest in design, politics and new technologies I believe I can make a thesis, which has values beyond just design. I believe I can show that transportation design can be much more than sports cars with advanced surfacing and big engines.

I have always liked to question things and especially issues related to environment. At the age of 10 I got interested in global warming. Therefore I got in touch with a scientist at the Swedish Metrological and Hydrological Institute. I asked him about his opinion regarding the ozon layer which was frequently on the news at that time. Since then I have had a big interest in climate changes and global warming. I also keep updated on international politics and other global issues.

The automotive industry is causing a lot of pollution and is a big global player. Therefore I think the industry should take more responsibility than what they do today. I have a feeling there are so much more that can be done by changing the industrie´s values when it comes to manufacturing and design. Well known companies should especially take lead and become role models for others. These companies have the same powers as nations today. With that power comes responsibilies which means that they need to have long term goals and not just focus on the next quarter report.

I want to make a concept which has an unique transportation design approch and show a vision of how the automotive industry could be more intune with the global context, and develope an appealing and useful design.

If you think you are to small to make a difference,
you haven't spent the night with a mosquito.

African proverb

2.2 MY QUESTIONS IN FOCUS

There are four questions that should lead me through the project. They should guide me to the right decisions when I am in doubt. The questions roots from my initial ideas about what my thesis should cover in terms of social aspects, innovations, sustainability and in the execution of the design.

1. How can BMW adapt to the culture rather than culture adapt to BMW?

2. What design opportunities does BMW have in new fast growing economies?

3. How could a vehicle be made sustainable without compromise?

4. What new innovations and technologies can support a vehicle in this context?

2.3 A CONSTANTLY CHANGING WORLD

The world tomorrow will not be the same as the one we saw yesterday. Culture, technology and trends are changing faster now than ever before and will most likely accelerate in the future.

A few hundred years ago the empires could last for centuries and new life changing innovations was rare. Those days are history. The last few decades the world have seen the man on the moon, cold wars, robots, an internet revolution and thousands of others big happenings which have changed the society totally. With a world which can change over night we have to be well prepared for all kind of scenarios and have in mind that something that seemed to be impossible yesterday, might be possible tomorrow.

2.4 THIRD INDUSTRIAL REVOLUTION

Every industrial revolution has been driven by new energy sources. First it was coal, second was oil and gas. Next industrial revolution will occur because of new sustainable and alternative energy such as wind and solar power.

In the last decades unexpected countries and regions have had a strong economical growth. Since the global economy get more complex the impact of small things can create big changes and opportunities for new upcomers. Especially the BRICS (Brazil, Russia, India, China and South Korea) have created an impressive economical wealth. Same thing can now also be seen in some countires in Africa e.g. Nigeria and Egypt. Since Africa has enormous natural resources and a young population it has the opportunity to become a continent with great influence globally.

They have so far struggled with colonialism, civil wars, starvation and corruption. The future of Africa seems brighter than ever before. By using all these strengths Africa has the opportunity to create a society of tomorrow. The improvement of living standards, unlimited sun power possibilites, resources and a not yet well developed infrastructure is making parts of Africa to a "blank sheet" where new communities and industries can be created from scratch.

Coal used as an energy souce in Europe and North America was an accelerator for the first industrial revolution in the 1850s. Today coal is not an alternative because of heavy pollution and we can see how the BRICS countries and the Next-11 have a big economical growth by using oil and gas instead. With every industrial revolution new discoveries within science has been made as well as new inventions, manufacturing and materials etc.

The next big revolution will have even more strict international laws and regulations and alternative energy has to be used and when its time for Africas revolution there might be 100% sustainable alternatives to use.

Source:	COAL	OIL AND GAS	ALTERNATIVE ENERGY
Year:	1800	1950	?
Inventions/ achievements:	Spinning Jenny Steam engine Metallurgy Rail roads Raw material extraction Capitalism etc	Fordism Electric motors Personal Computers Plastics Lunar landing etc	Super efficient solar Degradable products Biomimicry 3D printing farms Renting materials Upcycling of landfills Organic manufacturing Mars landing No extraction of raw materials
Where:	Europe North America Japan	BRICS NEXT-11	AFRICA?

2.5 BOOMING AFRICA

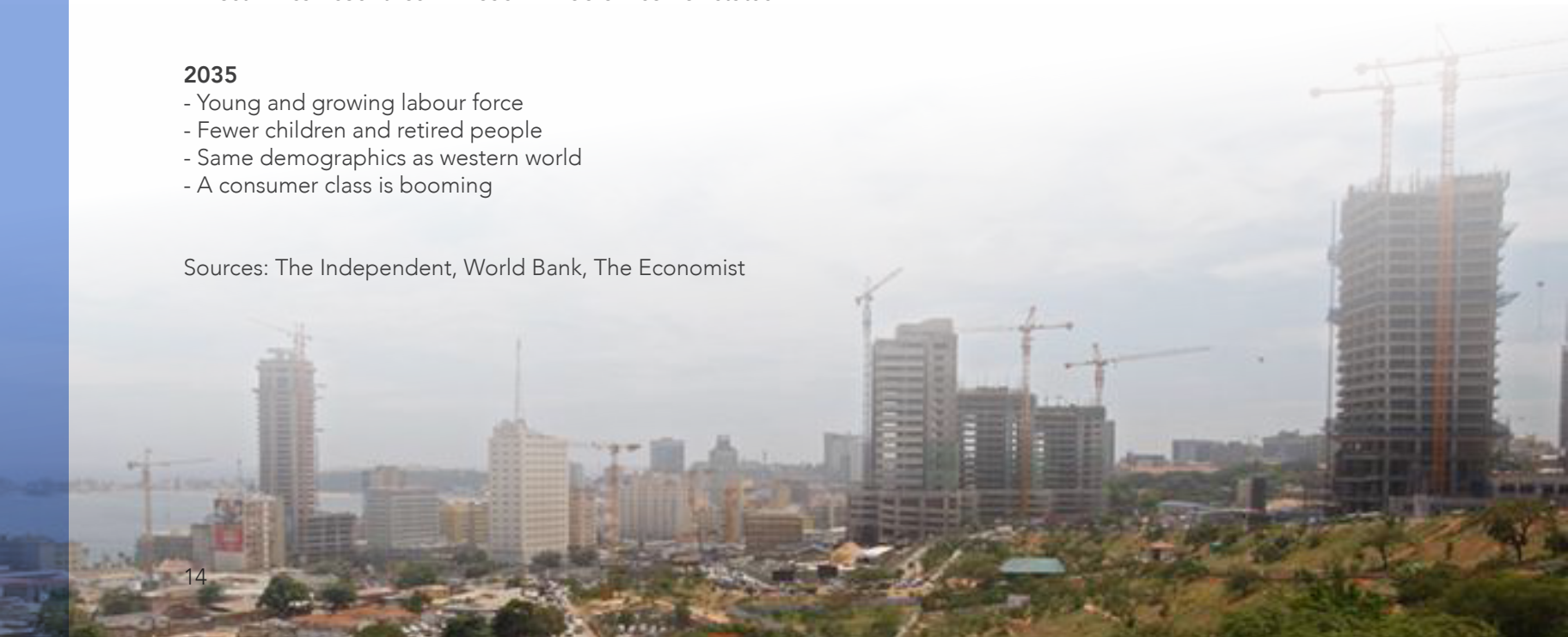
There are so many indicators showing that Africa is rising from poverty and becoming a continent with good health and economically strong countries. But not too many people are aware of this, blinded by old facts. Africa's enthusiasm for technology is huge. It has more than 600 million mobile-phone users. Since roads are generally dreadful, advances in communications, with mobile banking and telephonic agro-info is growing rapidly. Who would have expected China and India to become global players in the sixties?

2013
- Africa was the world's fastest-growing continent at 5.6% (GDP) a year.

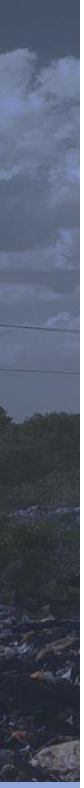
2025
- Most African countries will reach "middle income" status.

2035
- Young and growing labour force
- Fewer children and retired people
- Same demographics as western world
- A consumer class is booming

Sources: The Independent, World Bank, The Economist




AFRICA:
THE NEXT
BIG
ECONOMIC
BOOM
Africa
Crude Oil
Crude Oil & Petroleum Products
Oil
Gold
Coffee
Grains
Diamonds
Tea
Livestock
Crude Oil
Petroleum
Copper
Platinum
Tobacco
Soft Drink
MONEYWEEK
Booming Africa
The next economic superpower? Page 28
TIME
CAN NIKE REBOUND?
HOW CLINTON SURVIVED WILLEY
Africa Rising
After decades of famine and war, life is finally looking up for many Africans. Here's why.
Awa Koné, of Mali
AFRICA IS THE FUTURE
WWW.AFRICAISTHEFUTURE.COM



2.6 DON'T REDO SAME MISTAKES

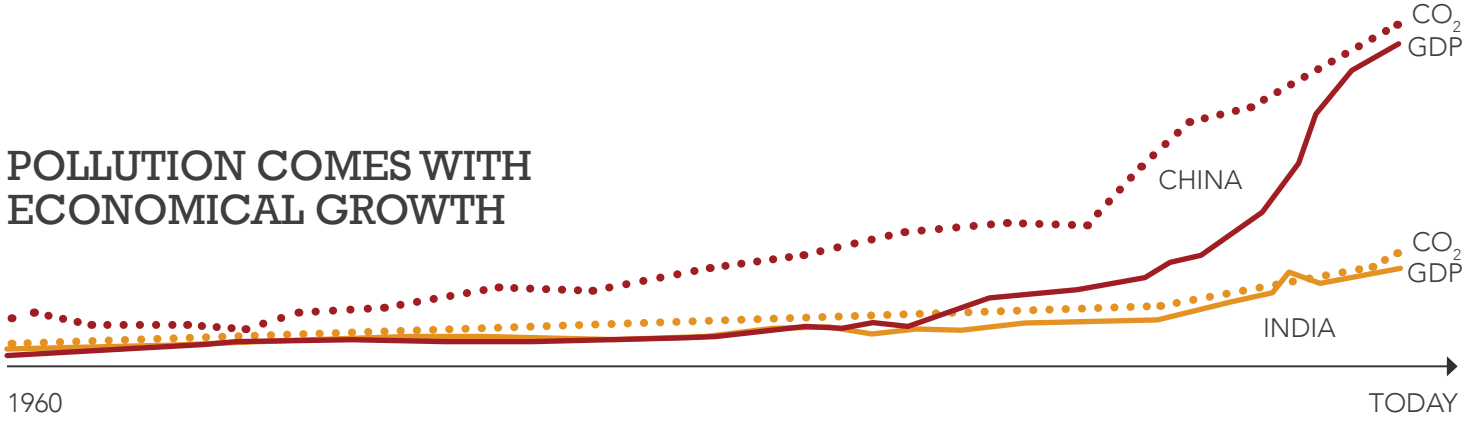
Due to fast growing developing countries we can today see the results of enormous problems with pollution and waste. It is important to see and learn from this and to make sure that we don't repeat the same mistakes again but in different regions and contexts.

The economical growth of China and India have had negative side effects. The higher living standard comes with higher consumption causing more waste and pollution, unfortunately the knowledge of waste management and pollution reduction is lacking. We can now see high level of smog in Chinese cities and that people have to wear masks to protect themselves against dangerous particles. India is another example were waste management does not work so well.This has led to rivers and grounds being covered with plastics and other toxic waste which causes diseases and dead land.

We can't just blame these countries governments and their people. It's also the responsibility of foreign companies and investors who are making business in these regions.
These companies has certainly not adapted their products to the society and infrastructure, but rather forced the marketing of already existing products. It is important to understand a countries culture, its possibilities and its limitations when introducing a product or lifestyle on a new market. Sometimes there could be a need to adapt the product to these new conditions.

There is a need for change when it comes to introducing products to new markets. It would be better to adapt products to the culture rather than adapting the culture to the product. There are plenty of examples how this has gone wrong and takes decades to repair.

POLLUTION COMES WITH ECONOMICAL GROWTH



Sources: World Bank, World Development Indicators

2.7 ONE SHARED PLANET

"If we want to help societies our first job is to listen, rather than to dictate what we think they need, and we must be prepared to be surprised. This is not just to do with remote tribal peoples: it's of vital relevance to all in a world where ideas of multiculturalism are misunderstood and under attack and where some increasingly want to force their views on others."

Stephen Corry, Director of Survival International, April 2007





There are more than 150 million tribal people worldwide. Most of them have been persecuted and faced genocide by diseases, relocation from their homes by logging and mining, and/ or forced to move because of settlers. But there are still some regions where these groups of people have been able to keep their traditions and lifestyles.

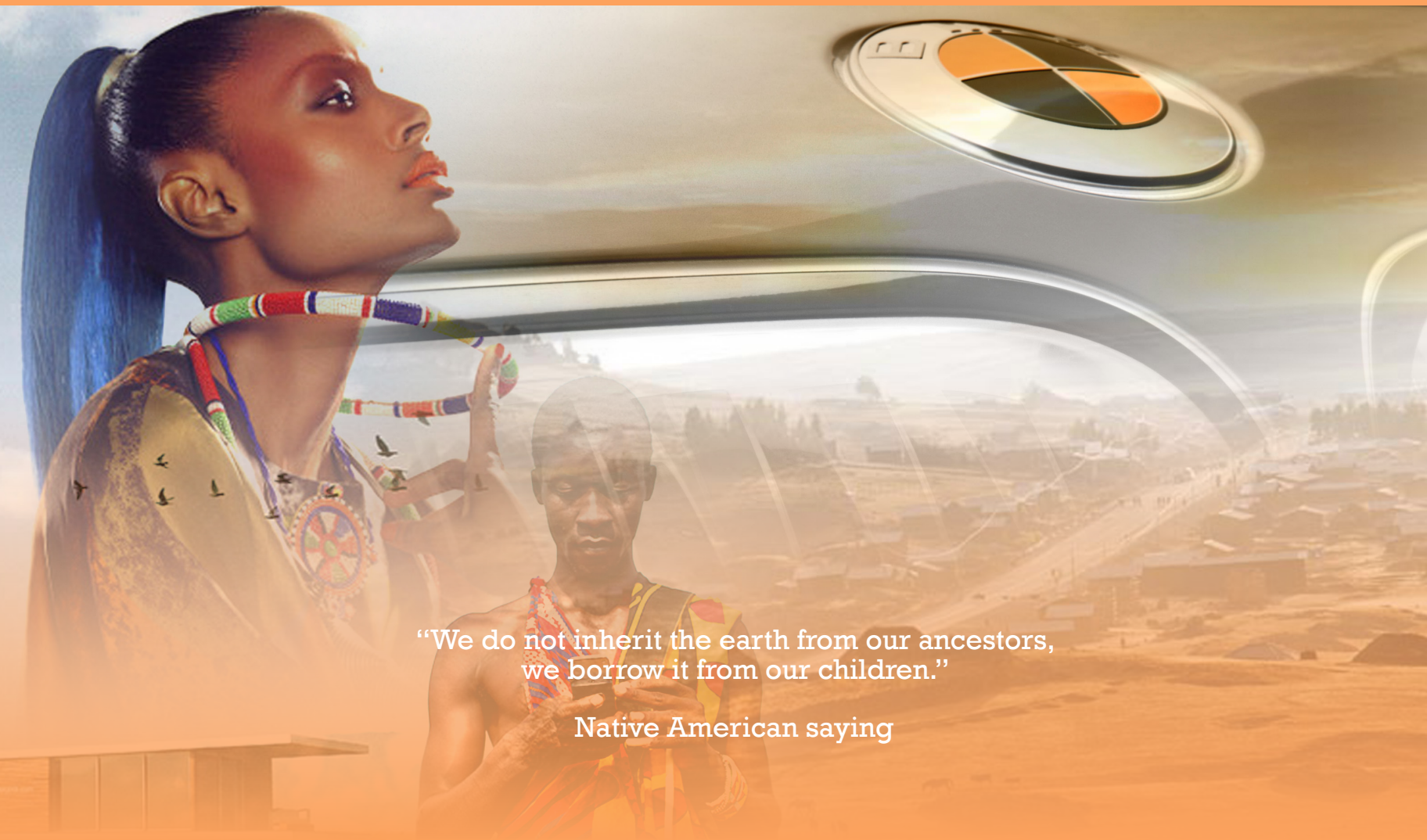
All these populations have one idea in common. It is to live at one with nature 365 days a year. Most of them are semi-nomadic and are used to adapt to limited resources. They know how to pay respect to nature in a way most other people don´t.

Because of the current urbanization and globalization these tribes are or will soon be part of two worlds. One world which consists of their old traditions and culture and another consisting of consuming and rapid change. These peoples needs has to be respected. It is in everyone's interest to make sure these two worlds are in balance to keep the planet and its people diverse.


DIVERSITY IS AN ASSET!

3 PROCESS

3.1 RESEARCH



"We do not inherit the earth from our ancestors,
we borrow it from our children."

Native American saying

3.1.1 WHAT IS SUSTAINABILITY?

The United Nations have said that nothing is sustainable if you can't fulfill three criterias. If any one of these are lacking it can not be considered as an intact solution or idea.

- **Zero environmental footprint**
- **No negative impacts on the society**
- **Cost efficient**

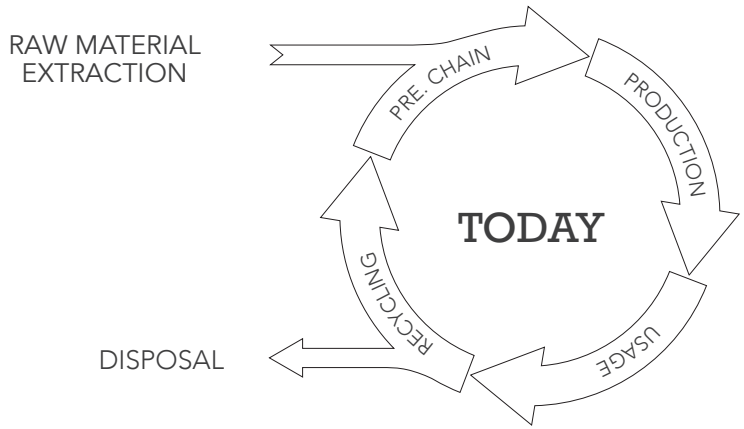
There are a few companies who have understood the importance of fair trade, sustainability and global responsibility. Both Patagonia and Fairphones are have managed to build successful brands and business models which are synonyms to these values. Which company within the automotive industry is going to be the pioneer?

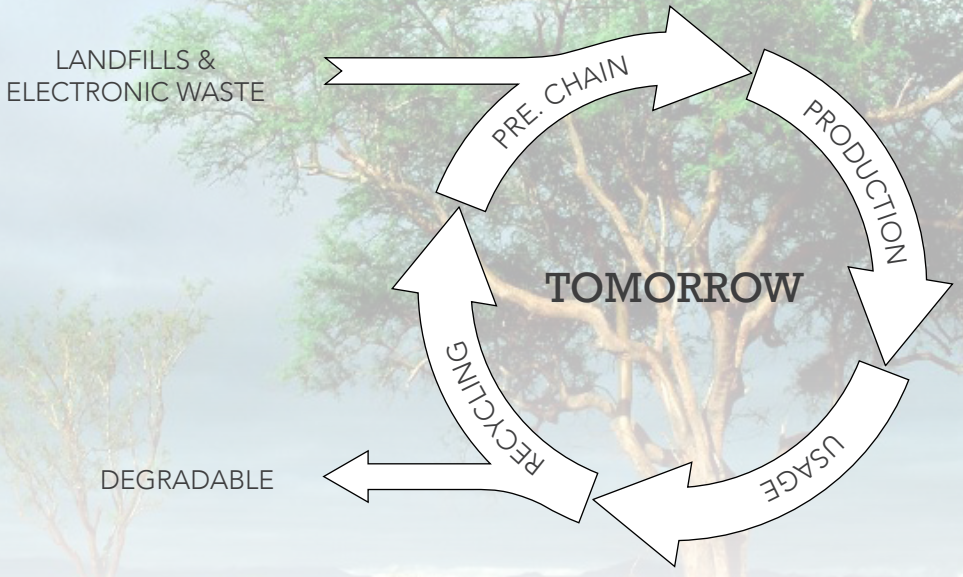
3.1.2 THE IMPACTS OF A PRODUCTS LIFECYCLE

Often companies are very keen to tell you how much of their products that are made of recycled materials, but never the less you seldom hear what will happen when it´s life ends.

It is a fact that we are today extracting and using more resources from our earth than what is viable. Booming economies are causing a huge demand of rare minerals and other raw materials. Not to often they are thinking in long term regarding the life cycle or what will be the results of heavy mining and production in fragile environments.

Africa is a continent which can´t handle its own waste and on top of that receives a huge amounts of waste from the rest of the world. Due to limited resources the people of Africa has proven to be good at reusing this valuable waste in various ways. Sadly it is not not done in a proper way causing child labouring and intoxication of the soil etc.





WHAT IF...

...BMW and other companies would own the responsible of the whole lifecycle from raw material to the end of the products life. By recycle already existing electronic waste, landfills etc you gain both cheap material as well as a better environment. Waste will become a valuable source in the future when there will be more restrictions regarding extracting new materials from the ground.

And the few materials we cant get from recycling we should get from natural produced sources which at the end can be degradable. This new model would also create new businesses, jobs, and reduce unnecessary transport over the world. It would also be a big statement globally from a big company such as BMW.

3.1.3 THE CRADLE OF HUMANKIND

The first traces of a humankind is found next to Serengeti, Victoria Lake. Serengeti is a part of both Tanzania and Kenya and is since 1952 a National Park. In 1981 it became a part of UNESCO World Heritage List. This is also the land where Africa's most well known tribe is living. The name Serengeti is Maasai and means - The place where the land runs forever.

POPULATION

The estimated population growth in Tanzania and Kenya is approx 100% in 2040. Total population of Tanzania and Kenya would be 189 million according to United Nations. Today the Maasai population is 0.8 million but in with same estimated growth it would have increased to 1.6 million.

ANIMAL LIFE

Serengeti is famous because of the big biodiversity of animals. Especially the amount of gnu, zebras, buffels, giraffes and elephants and many more. They have additional 13 species of predators such as lions, leopards, hyenas and cheetahs.

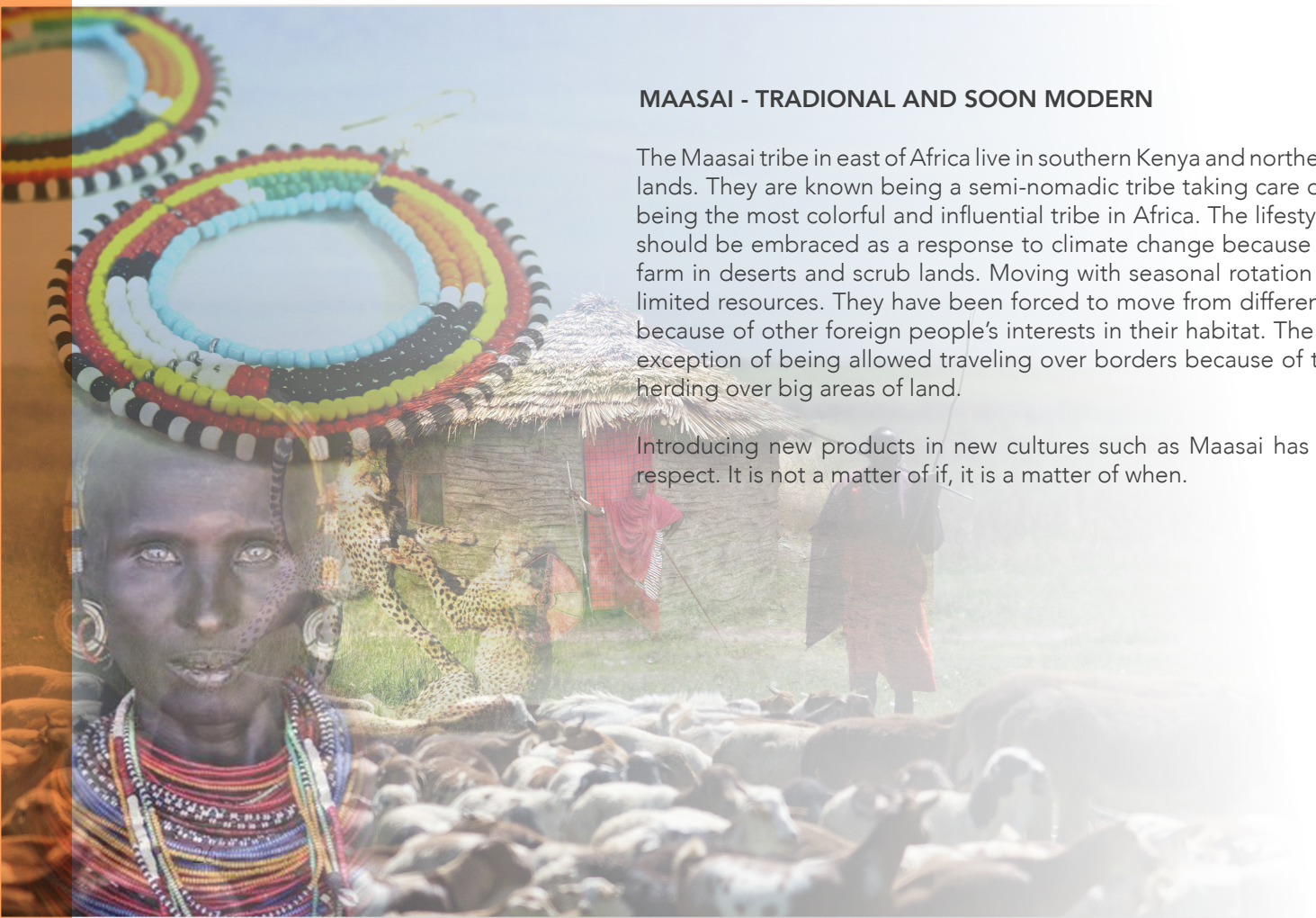
NATURE

Serengeti covers 14,750 square kilometres of grassland plains, savanna, riverine forest, and woodlands. But the nature is under constant threat because of urbanization, tourism and climate change.


KENYA
43 millions 2012
(Est. 86 Millions 2040)
SERENGETI
NATIONAL PARK
14750 km2
NAIROBI
3.3 million 2009
(Est.10.5 millions 2040)
TANZANIA
47 millions 2012
(Est. 102.7 Millions 2040)
DAR ES SAALAM
4.4 millions 2012
(Est. 14.2 millions 2040)

3.1.4 TRADITIONAL VS MODERN LIFESTYLE

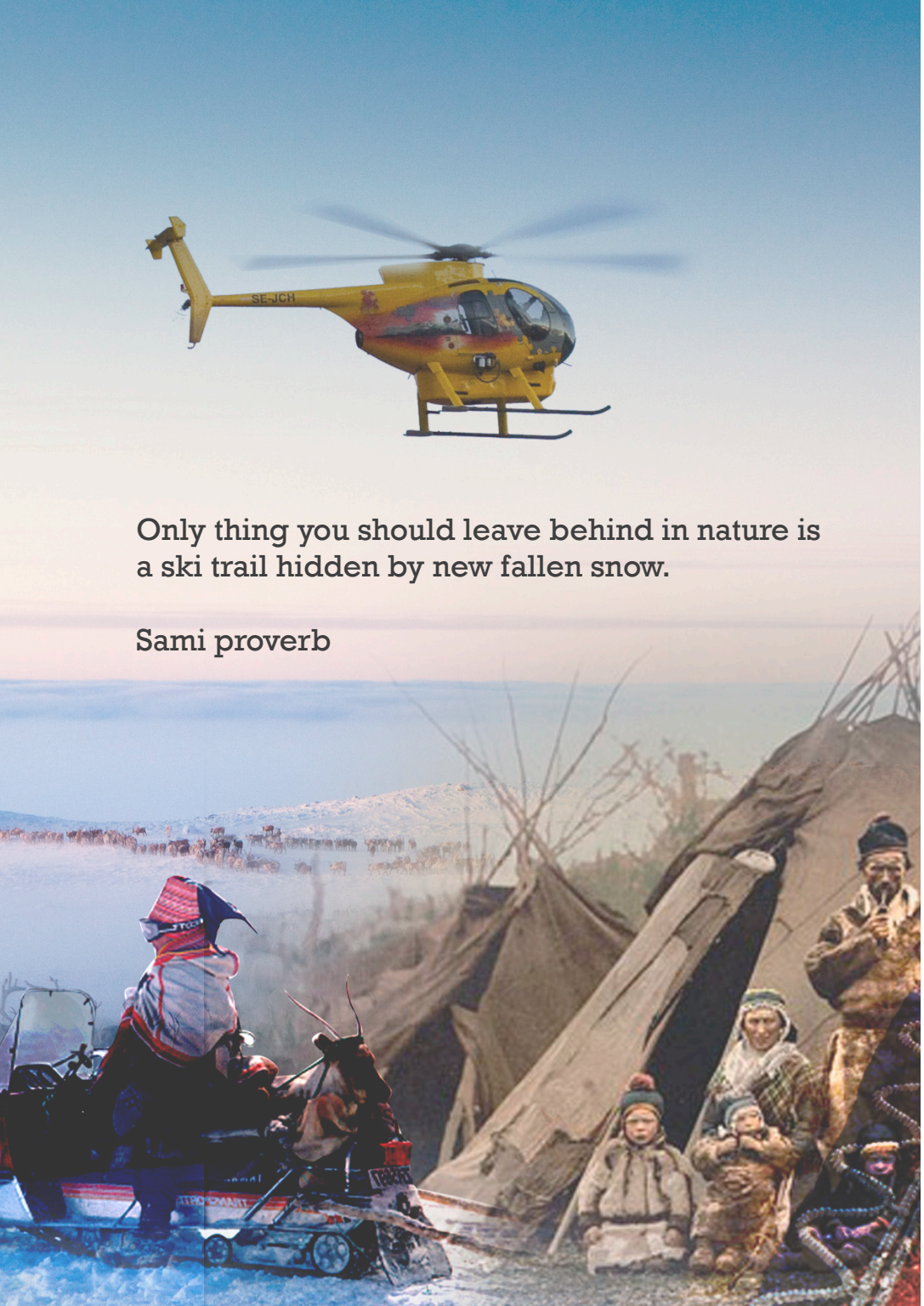
The Sami population in Sweden is an example of how a culture can survive and live side by side with a modern society. The Sami identity is very strong and they take care of their old traditions while living a modern life. In another part of the world there are a group of people, The Maasais, who have a lot of similarities with the Sami people. However right now they are struggling.



MAASAI - TRADIONAL AND SOON MODERN

The Maasai tribe in east of Africa live in southern Kenya and northern Tanzania in dry lands. They are known being a semi-nomadic tribe taking care of their cattle and being the most colorful and influential tribe in Africa. The lifestyle of the Maasais should be embraced as a response to climate change because of their ability to farm in deserts and scrub lands. Moving with seasonal rotation they are used to limited resources. They have been forced to move from different areas to others because of other foreign people's interests in their habitat. The Maasais have an exception of being allowed traveling over borders because of their traditions of herding over big areas of land.

Introducing new products in new cultures such as Maasai has to be done with respect. It is not a matter of if, it is a matter of when.



Only thing you should leave behind in nature is a ski trail hidden by new fallen snow.

Sami proverb

SAMI - MODERN AND STILL TRADITIONAL

Sami people are strongly connected with reindeer herding. Today there are still many who actively herd on full-time basis. During some periods of the year they live semi-nomadic in northern Sweden, Norway, Finland and Russia. For traditional, environmental, cultural and political reasons, reindeer herding is by law reserved only for Sami people in Sweden.

The Sami have adapted their culture and lifestyle to the modern society and are now using new technologies to support their living. They are using snowmobiles, cars and even helicopters when herding.
The western culture have had a big impact on the Sami but you often see them wearing traditional clothes and jewelry proudly. Their handicraft have become popular among non-Sami people and has become a way for the Sami to make business.

3.1.5 MOST COLOURFUL AND INFLUENTIAL TRIBE IN AFRICA

The lifestyle of Maasai is very sustainable as they pay respect to the nature and herding has been their main activity to survive. Because of globalization their lifestyle is changing due to of all new influences from the modern world.

FAMILY

Large families were traditionally considered a sign of prestige and wealth but today the families are getting smaller due to a different lifestyle. Most children are today going to school. Polygyny and polyandry is not common longer.

HERDING

Herding is a big part of their lifestyle and a way of showing social status. Their cattles are consisting of goats, sheeps and cows and is a big income and resource for food. When their land is shrinking due urbanization the herding is becoming difficult.

FOOD

Most of their food comes from the cattle. But it is getting more common to also eat other vegetables when they are lacking of meat, blood and milk. The climate makes it harder to find fresh water.

HOUSES Inkajijik

Simple houses are made of clay, wooden branches and manure. Their houses and cattles are protected from outside predators with fences in villages called Boma.

JEWELLERY

The jewellery is made of locally and traded beads of bone, wood, brass, ivory, glass etc. The colours has different meanings and social status.

LIONS Panthera Leo Masaica

Previous boys had to kill a lion to become a man, but due low lion population its not practiced any longer. Lions are a big threat to the villages and cattles.

CLOTHES Shuka

Their clothes were earlier made of leather but are since 1960s replaced with red, blue and black plaid and striped commerical cotton.

WARRIORS Murrans

The warriors are protecting the tribe, and cattles from lions and other threats by patrolling.

TRADING

For extra income other businesses in urban areas are common such as trading and restaurants but also tourist guiding in Maasai land.

INSIGHTS!

Families are becoming smaller because of the modern society and their children are able to get a formal education and therefore is in need of good transportation.

Getting food and access to water becoming more difficult and time consuming due **climate change** and reduced land.

Extra income such as trading and other businesses are getting more common but are **limited due to few options of transportation.**

3.1.6 AFRICAN MOBILITY AND VEHICLES

A large part of Africa's population are largely immobile. Without appropriate transport services millions struggle everyday to access basic life supplies and services such clean drinking water, farming inputs, hospitals, schools and jobs.

YESTERDAY

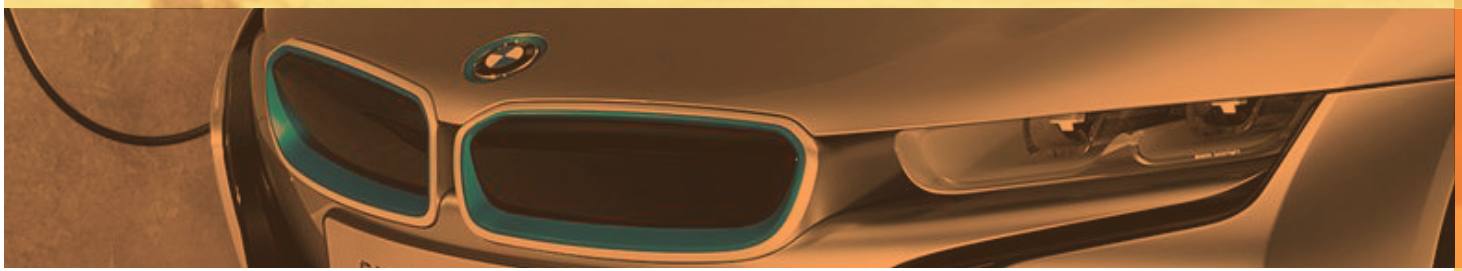
Toyota, TATA and others

Toyota, TATA and other Asian brands are over representing the vehicles in Africa and are not designed for the their local needs. Due to lack of original parts and functionality modification are done to make them more durable for the peoples need.

TODAY

Mobius Motors

Mobius Motors are producing cars locally in Kenya which are made for the African market and infrastructure. There vision is to build a vehicle which is supporting entrepreneurs, school transport and medical transport etc by offering a simplified product with maximized functionality with integrating off-the-shelf parts.

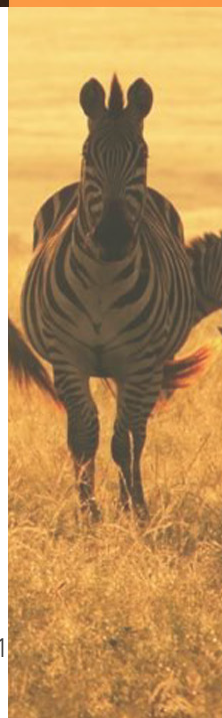


TOMORROW

BMW

BMW has a big opportunities to offer new sustainable mobility solutions in a developed and sustainable Africa. It is important that BMW learns and adapt their products to the new needs.

There will be a big need for vehicles designed for a developed and sustainable Africa!



3.1.7 FROG LEAPING

When booming countries have been exposed to new technologies and trends they have been taking short cuts from very primitive manners and products to allowing them getting the latest and most premium.

African telecommunication

The regular telephone land line have never been available for most of the African population. But when the cell phones got available for the African population the region took a big leap in telecommunication andcreating new business opportunities.

Chinese premium car market

Another examples of this is when premium brands have introduced their products in China and the Chinese customers are going straight for the more exclusive models.

What will happen with the African car market?

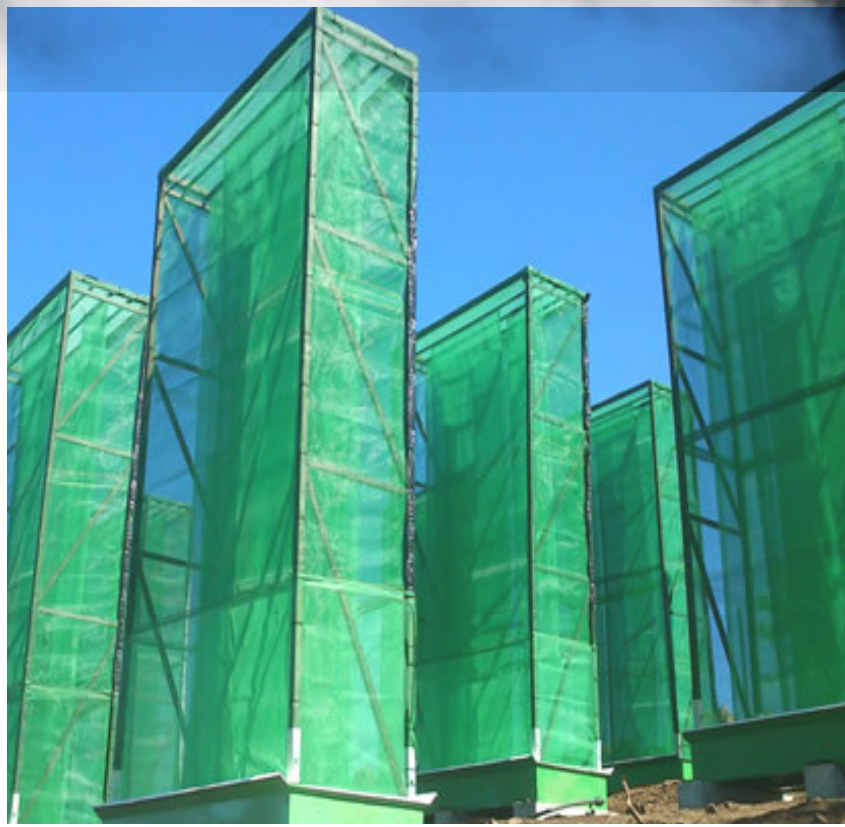
In same way as the examples of telecommunication in Africa and premium cars in China. It is very possible a similar shortcut will happen when the automotive market will boom in Africa. From having very primitive transportation, to sustainable efficient vehicles.

3.1.8 TECHNOLOGIES

FOG HARVESTING

Fog harvesting is a known simple technology to collect water in dry climates such as Africa and Asia. Through a process known as condensation, atmospheric water vapour from the air naturally condenses on cold surfaces into droplets of liquid water known as dew. As the exposed surface cools by radiating its heat to the sky, atmospheric moisture condenses at a rate greater than that of which it can evaporate, resulting in the formation of water droplets. Technology for this process is constantly improving and new materials are used for better efficiency.

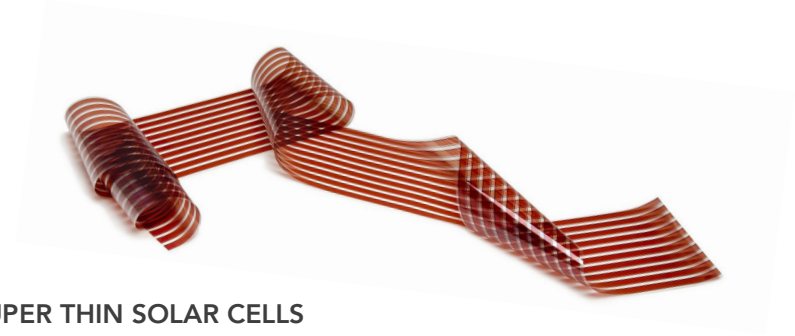
PURE GREEN-TECH



MYCELIUM COMPOSITE

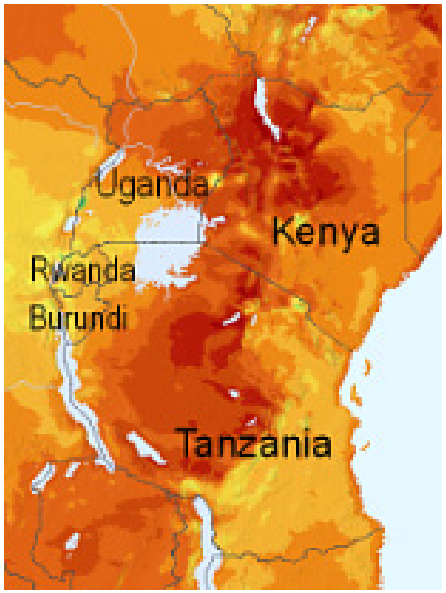
Mycelium is the vegetative part of a fungus, consisting of a mass of branching. The mycelium binds together renewable waste materials in a process that can be used literally to grow products into a strong all natural composite in just a few days. The composite has several positive properties, such as sound absorbing, crash absorbing, being degradable and having low production costs.

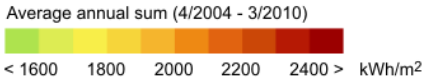
ZERO WASTE!



SUPER THIN SOLAR CELLS

The company Power Plastics and scientists from the CSIRO has both developed solar cells which can be printed with organic inks that have semiconducting properties. The materials which are used are inexpensive, environmentally friendly and easy to access. When this new type of solar cells are available to the industry there will be a revolution.





UNLIMITED SUN ENERGY

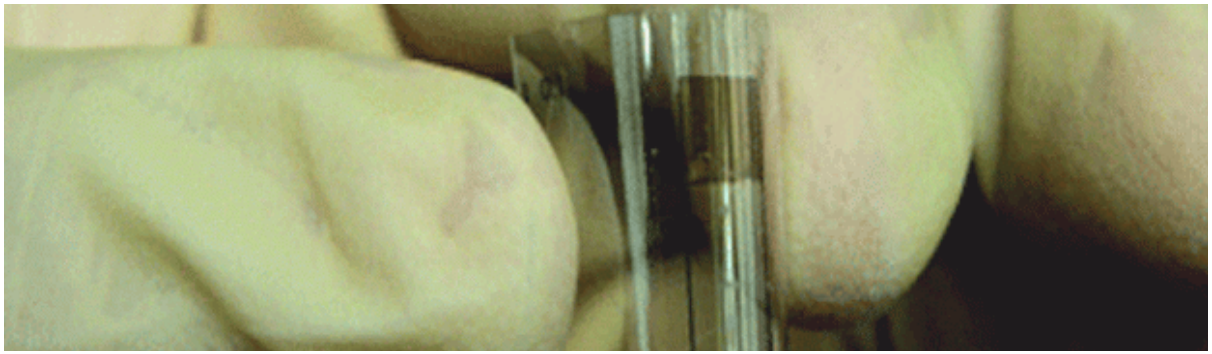
The sun is the energy source which are enabling life on earth. Africa is a continent of sunshine and intensive heat. Africa is also dominated by clear skies due a low cloud cover and the proximity with the equator the solar power potential is big. There are big opportunities to use this energy in any location of Africa without any large scale of infrastructure.

No need for infrastructure

State-of-the-art thin film batteries

MICRO SUPERCAPACITORS

Graphene based micro-supercapacitors are newly emerging miniaturized high-power micro electrochemical energy-storage devices that can deliver high power density, fast charge and discharge, and a lifetime of millions of cycles.



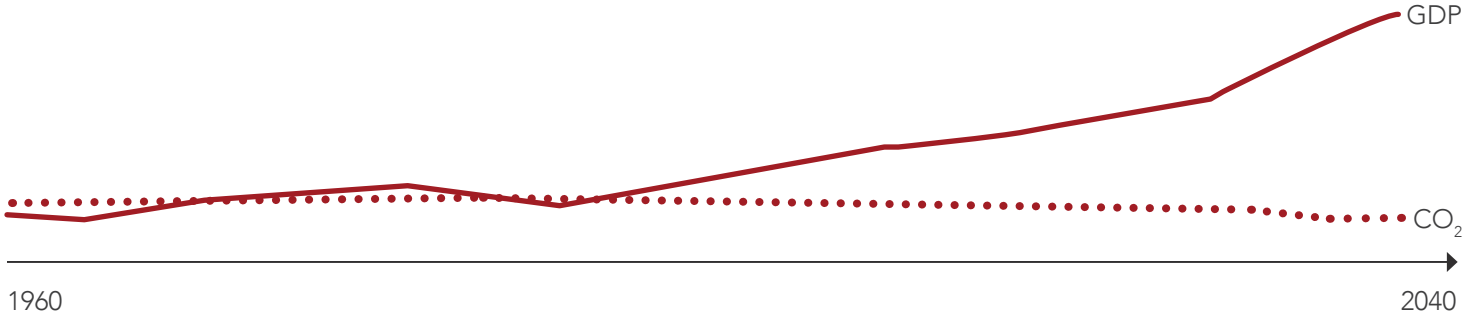
3.2 AFRICA 2040

This story is told in Africa but the concept
is meant to be applied in new booming economies
where urbanization is threatening.

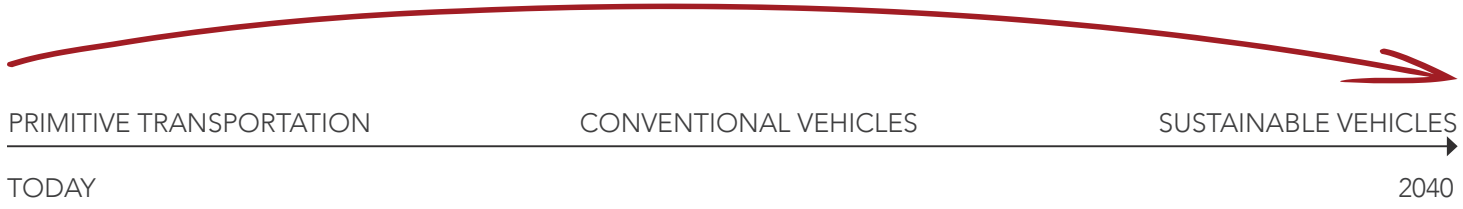
3.2.1 A NEW GLOBAL SITUATION

The world in 2040 will be changed and Africa and other developing regions have had a big economic growth and the standard of living and sustainability is equal or better compared to the western world.

The new big market have forced the car manufacturers to take a bigger responsibility and adapt to new cultures and environments to use local materials, reuse and process existing waste from previous generations landfills, come up with new sustainable methods in manufacturing and transport. Additionally they need to create a product life cycle which does not leave any ecological foot prints.



The pollution is not longer following the GDP in year 2040 and Africa has made a big jump from no transportation straight to sustainable vehicles.



3.2.2 INFLUENCIAL TRENDSETTERS

Imagine that in 2040 the Maasai fashion and thinking would influence sustainable lifestyle both on a regional and international scale. The Maasais will be leaders in technology, entertainment, fashion and design. If BMW does not offer them new mobility they will build it themselves.

In the new world order Serengeti is mentioned as much as Paris, New York, Sillicon Valley, London and Milan. The new generation of Maasais will be progressive and successful entrepreneurs. They are all philantropists and open minded towards other cultures and inovations, living in a modern society which allows traditional activities such as being a nomad.

- **Progressive and succesful**
- **Philantropists**
- **Open minded**
- **Smart consumers**
- **Fashionable**
- **Green and healty lifestyle**
- **Traditional but modern**
- **Semi nomadic**

"Part of being optimistic is keeping one's head pointed toward the sun, one´s feet moving forward."

Nelson Mandela

3.2.3 THE VEHICLE

The specifications for the vehicle is based on the needs of the research, scenario and persona. The new Maasai BMW vehicle is allowing them to travel between the new modern world and the traditional. Supporting their daily life with business and practicing traditional activities.

SUSTAINABLE DESIGN

Alternative energy, fair labour and environmentally friendly manufacturing/materials.

ALL TERRAIN VEHICLE

The semi-nomadic lifestyle and big landscapes requires a vehicle which can go off-road but still enter cities.

SHARED MOBILIY

The transportation will be shared within the village and therefore have to be an utilitarian multi purpose vehicle.

ADAPTED TO CULTURE

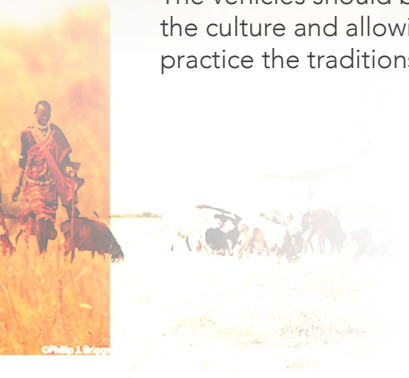
The vehicles should be inspired by the culture and allowing the Maasai to practice the traditions.

DYNAMIC INFRASTRUCTURE

The vehicle is a part of an dynamic infrastructure for mobility, communication and services.

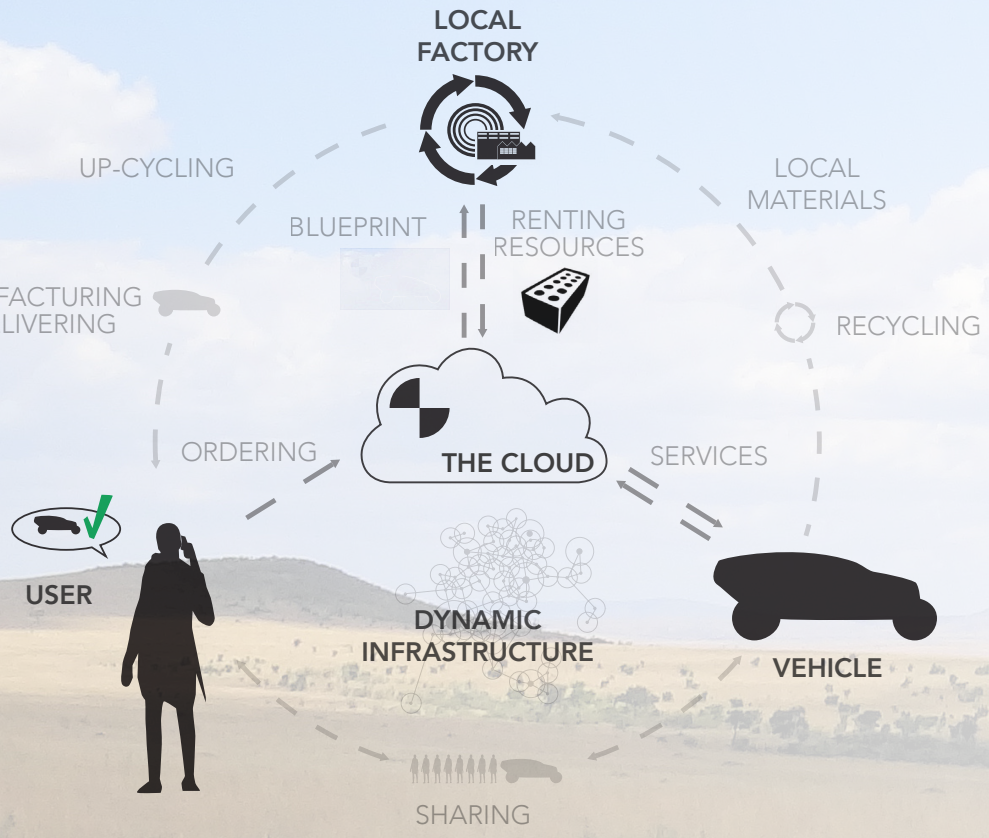
NEW DEMOGRAPHICS

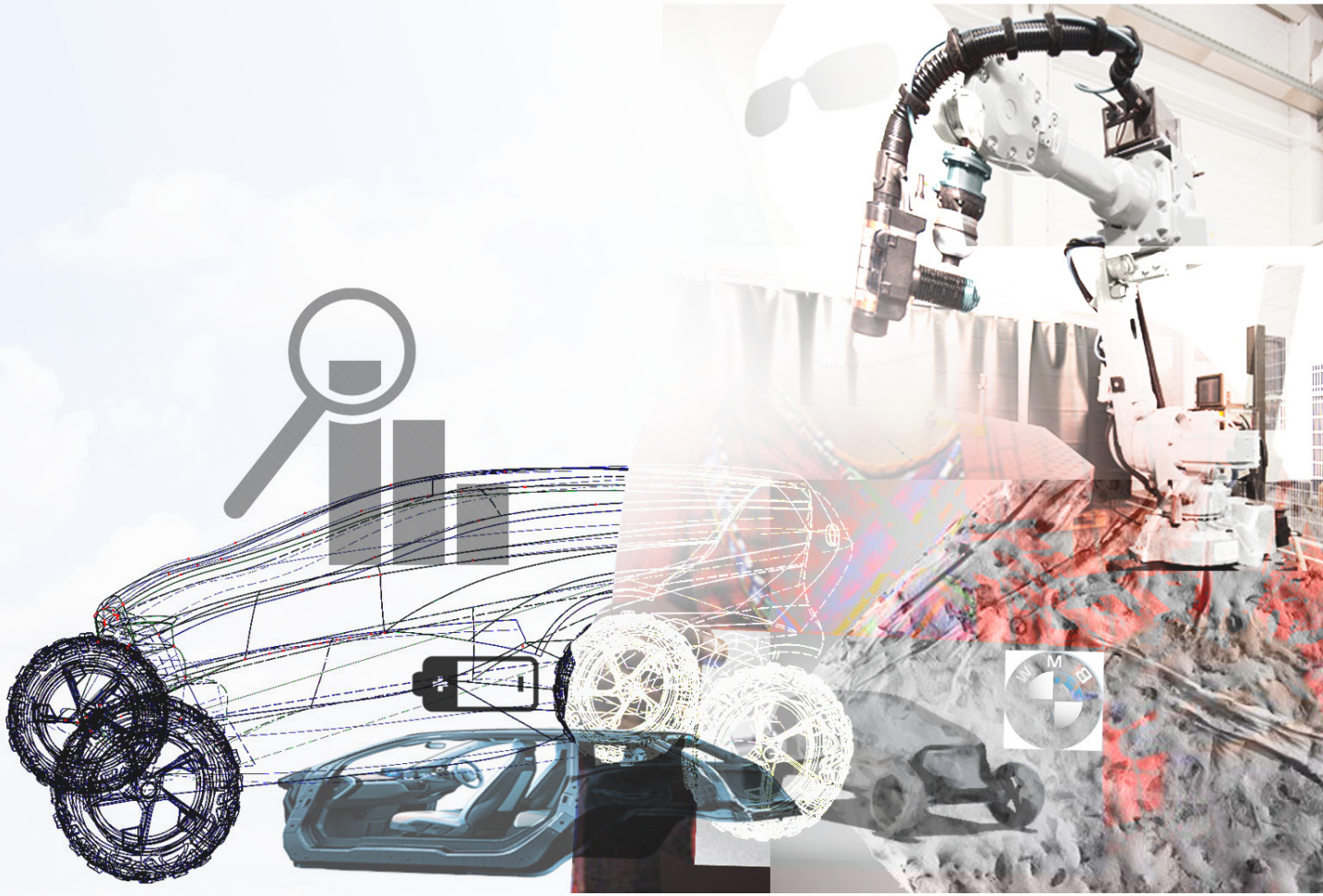
Due new demographics of smaller families in Africa the amount of seats is set to 4+1.



3.2.4 THE CLOUD

The vehicles will be connected to a cloud which BMW is offering and has developed. It is providing all the touch points when buying the vehicle, during manufacturing as well as monitoring the product's life cycle to make sure there are no negative impacts, neither environmentally nor socially.



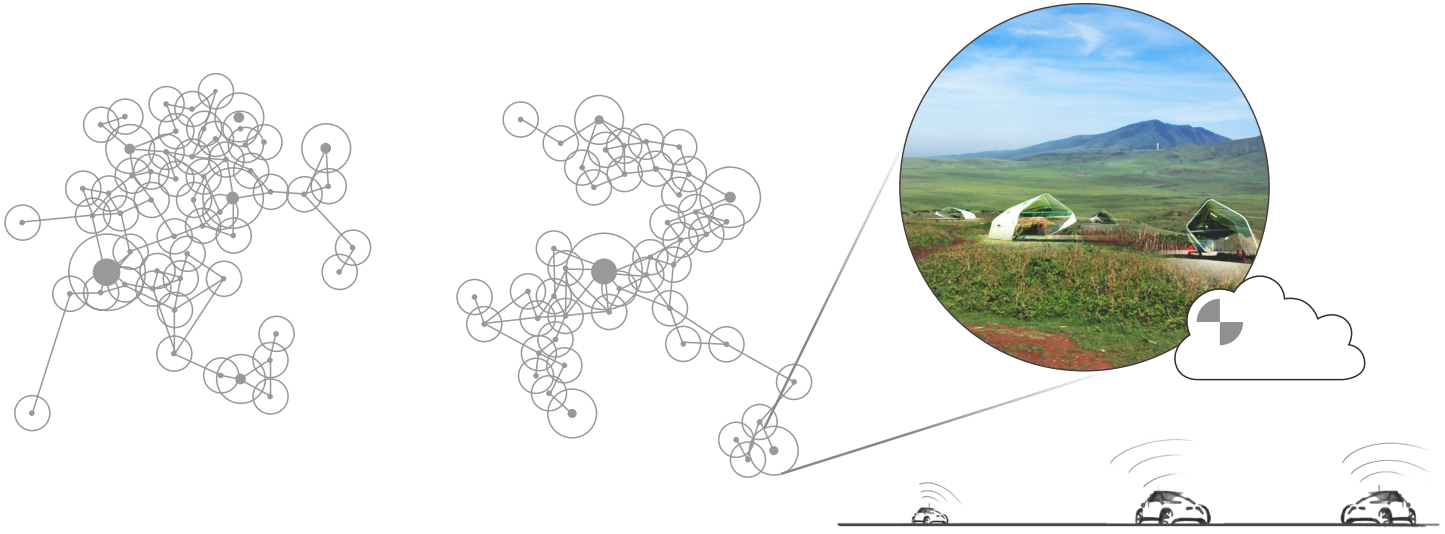


MONITORING THE WHOLE LIFE CYCLE

As a user you would share a vehicle with the people in your village. Most of the vehicles will be produced locally with blueprints which you have ordered from BMW through the Cloud. Just a few parts have to be shipped. BMW is monitoring the whole process, responsible for renting the resources from the government, ensuring fair labouring and etc. This is all possible because of the Cloud which connect BMW with the users, vehicles and local factories.

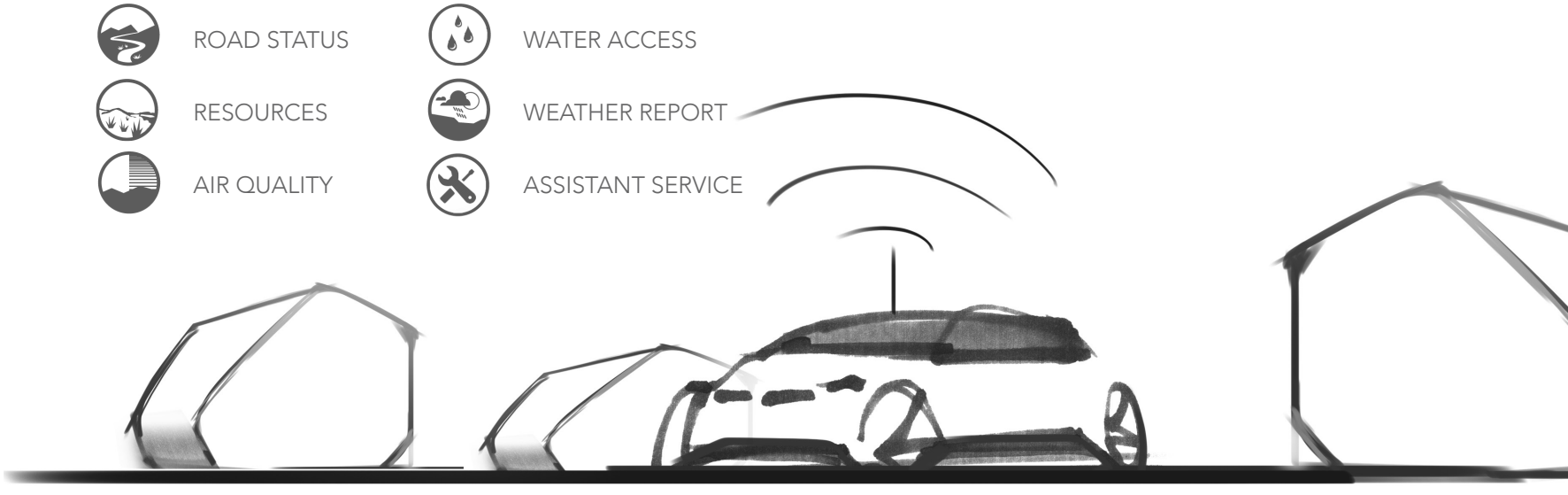
DYNAMIC INFRASTRUCTURE

According to traditions they say no one should be denied access to natural resources such as water and land. Same idea would be applied on the infrastructure. It is not made out of roads, instead it is based of a dynamic open network which allows a semi-nomadic lifestyle over big lands.



The infrastructure is build of wireless connections. Vehicles are connected in between each other and sharing information on weather conditions, road status and other relevant information. Due the semi-nomadic lifestyle in huge areas of land there is no need for traditional roads as the main infrastructure. They do still exist and will be build but are not necessary the most important when using transportation in Africa 2040. The constantly changing infrastructure will always be more dense when its most seasonally needed.

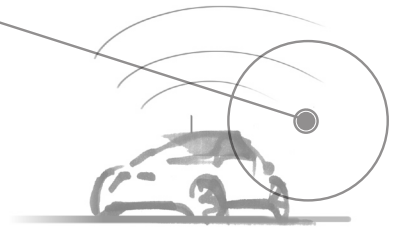
The Cloud is also providing other services such as finding resources, air quality, water access, weather reports and monitoring the vehicles status. The vehicle also has an important role in the village, connected 24/7 sharing this information.



LOCAL FACTORIES

The factories in 2040 will be using 3D-printing farms and other alternative manufacturing methods. They are not just producing one kind of products, but everything from vehicles, parts for houses, electronics etc.

Because of the seasons with dry climate its important to make sure the pasture areas can recover. Here the Cloud can assist with constantly updated information for the local factories. They now know where to find sustainable resources preventing from delays as well as further damage to the environment.



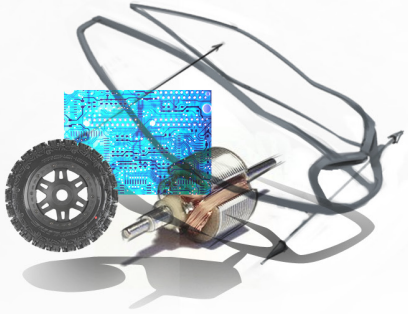
VEHICLE

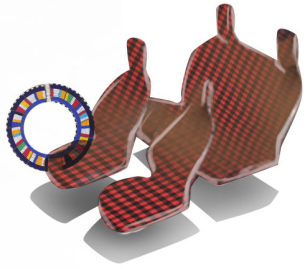
THE CLOUD

LOCAL FACTORY

ALTERNATIVE MANUFACTURING

The different alternative manufacturing methods which are used are growing, 3D printed and uptcycle materials and locally made handicraft.





GROWING

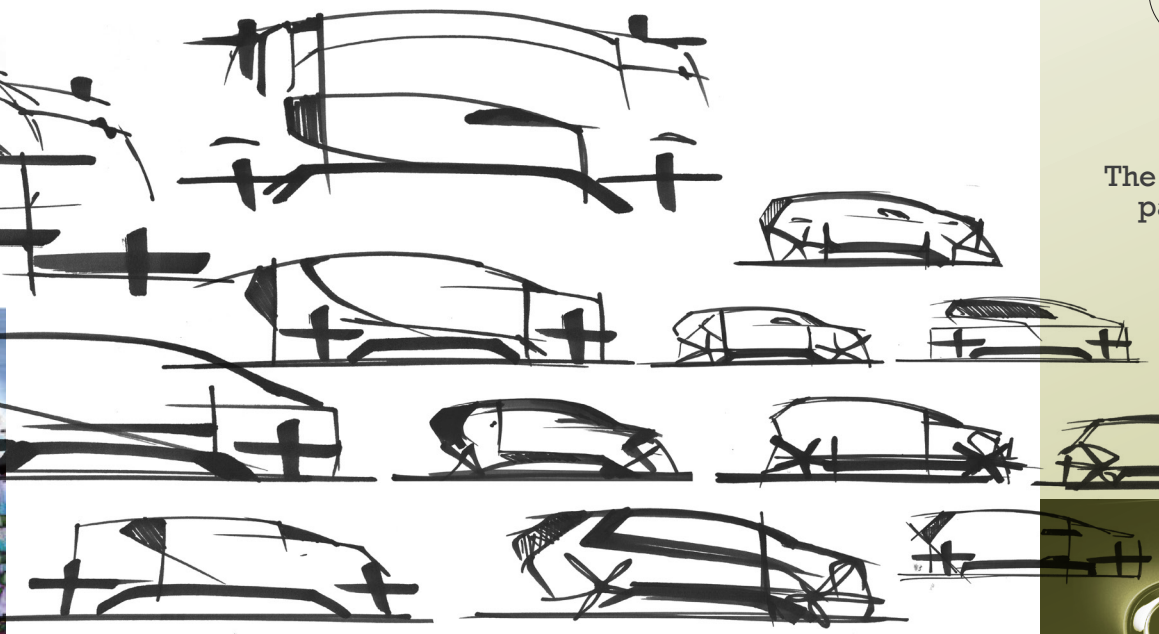
3D PRINT

HANDICRAFT

3.3 DESIGN PHASE

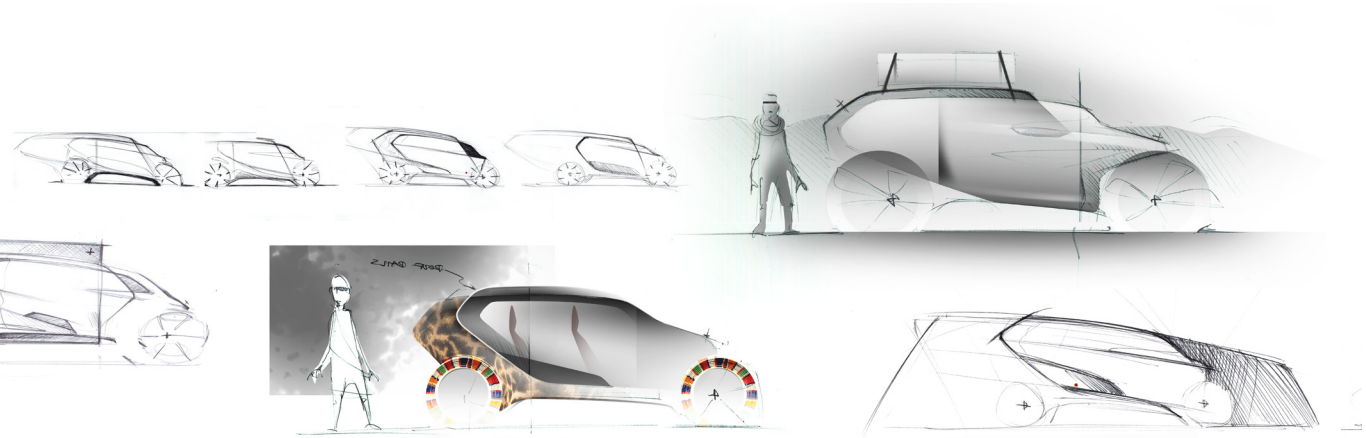
3.3.1 INITIAL SKETCH IDEATION

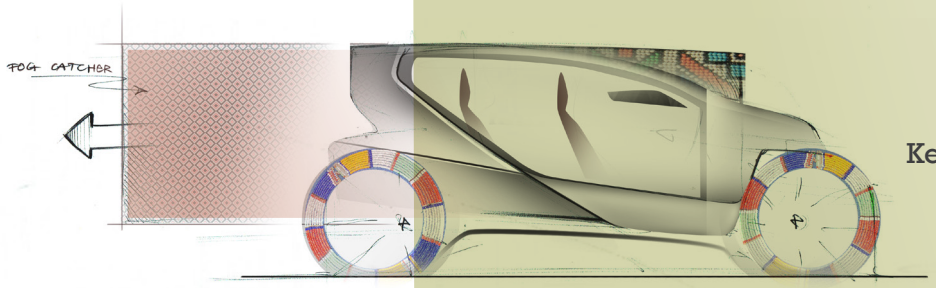
In the early design phase it was important to find a simple silhouette which was easy to recognize and where the well known design features also had a purpose and not exists because of styling.

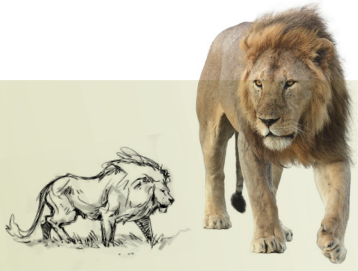


The kidneys and hofmeister kink is a part of the supporting structure.

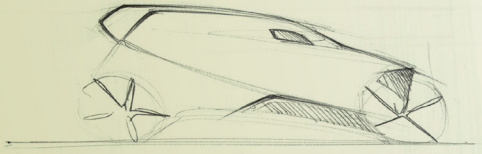
3.3.2 DESIGN INSPIRATION

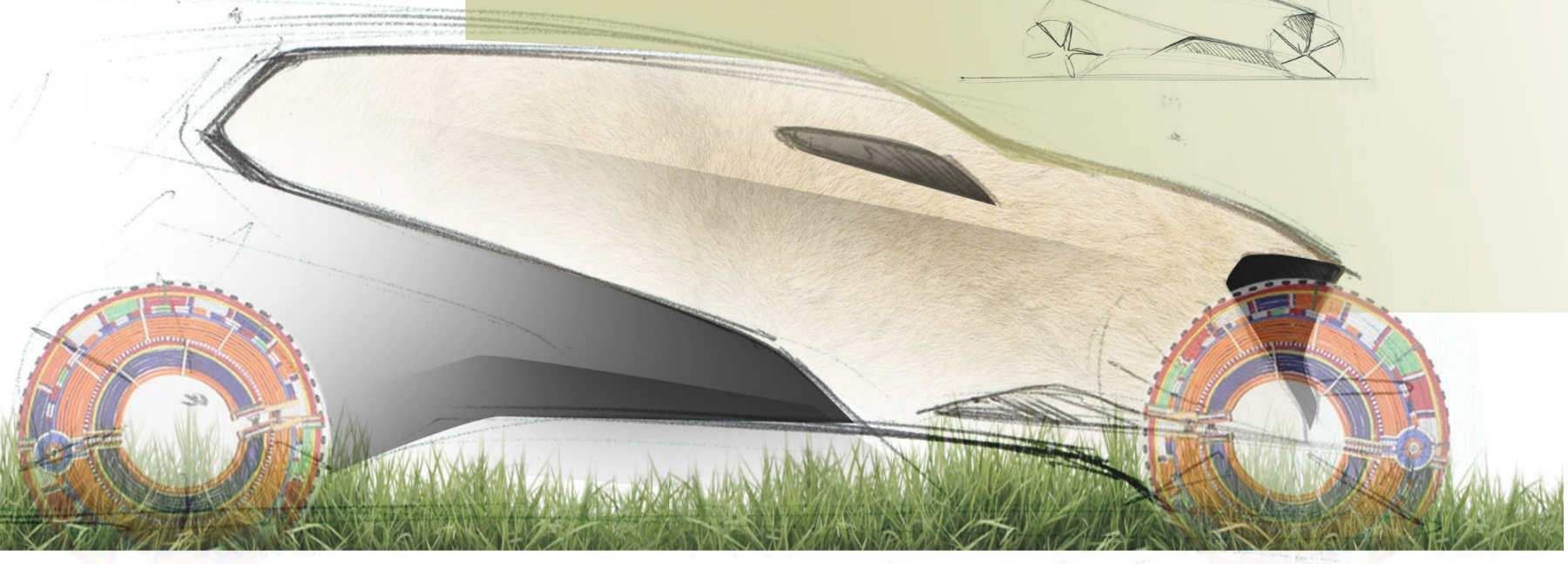




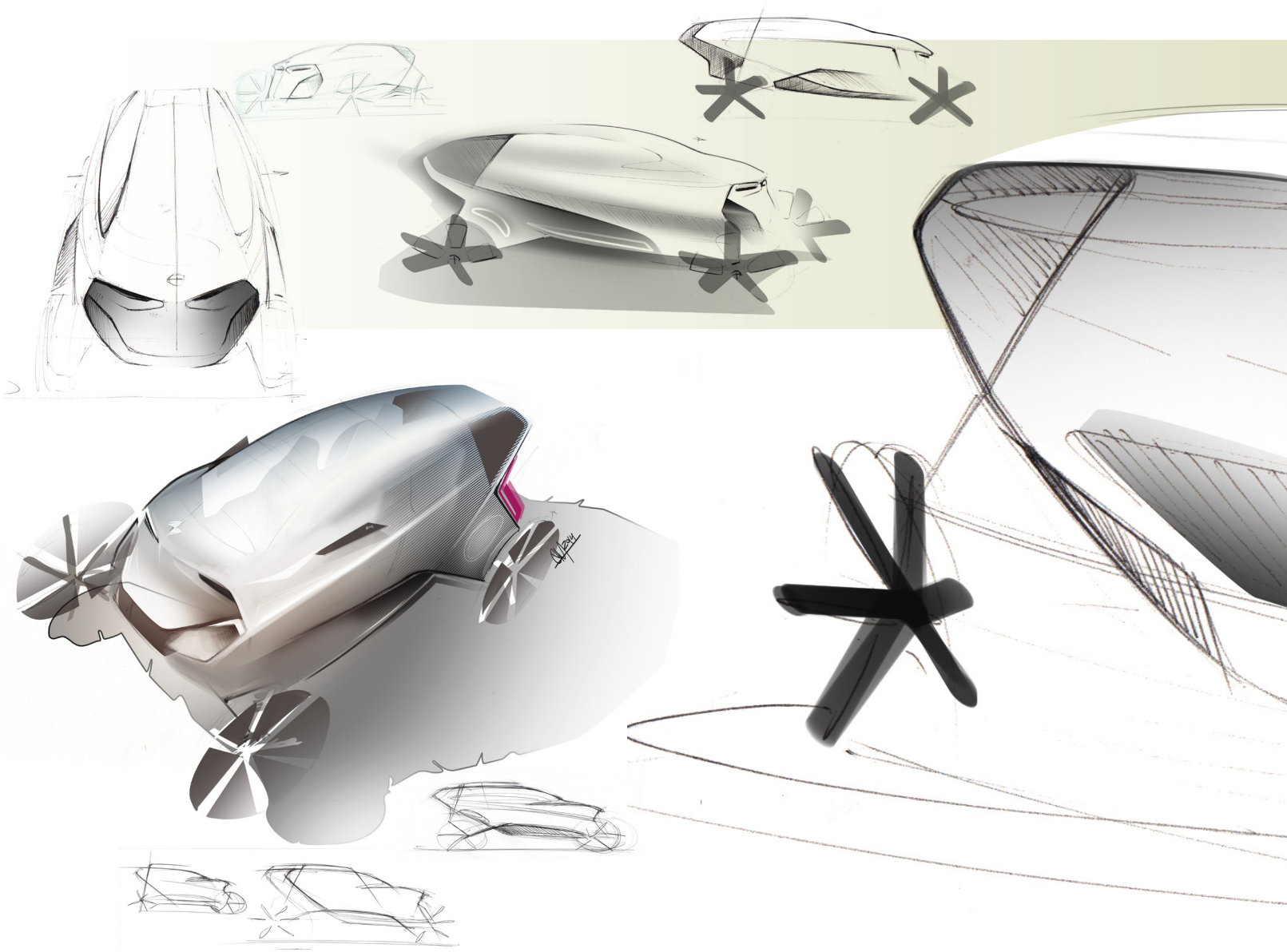


Keysketch where the lions head is captured as a silhuette for the vehicles body side.

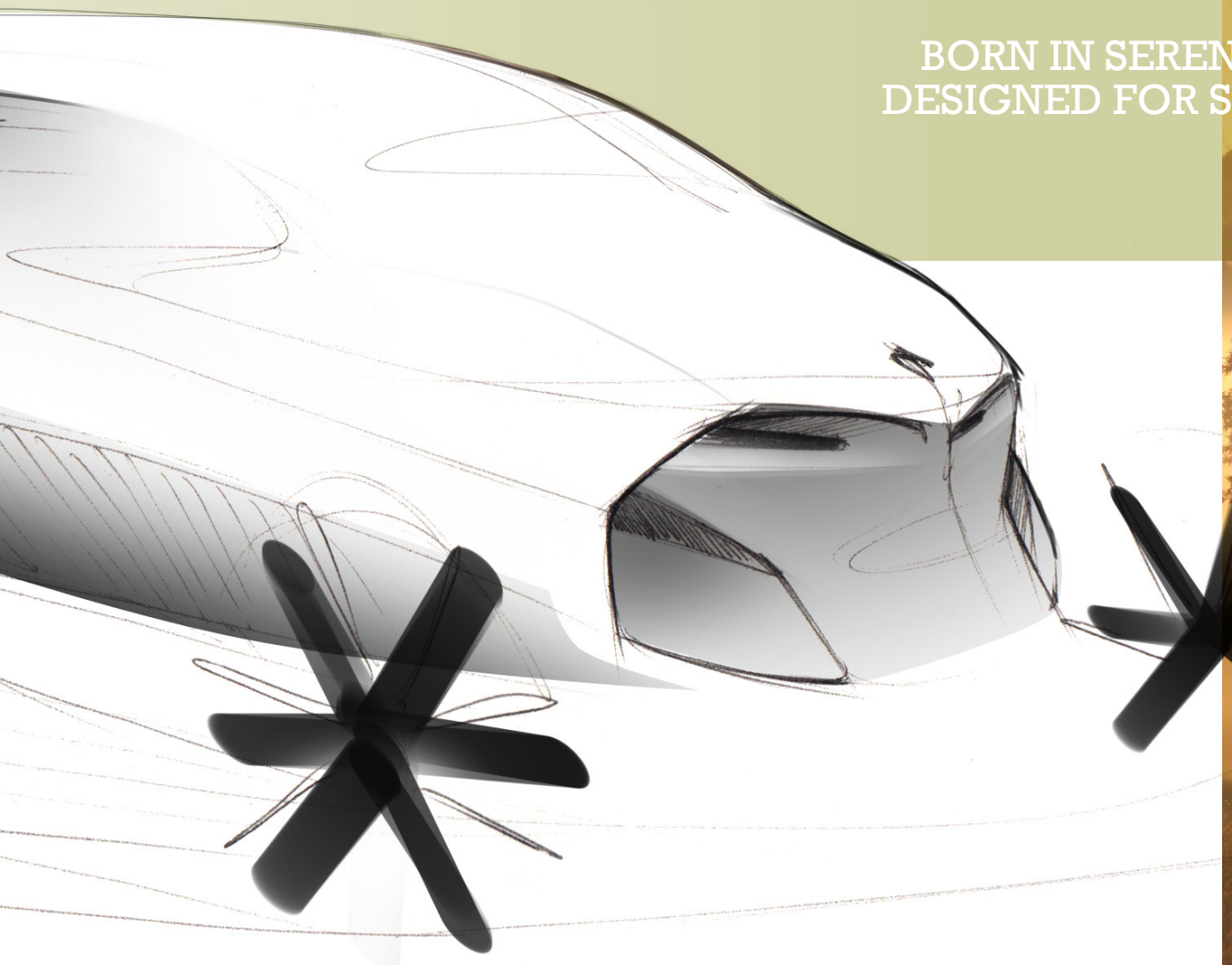




3.3.3 DESIGN DEVELOPMENT

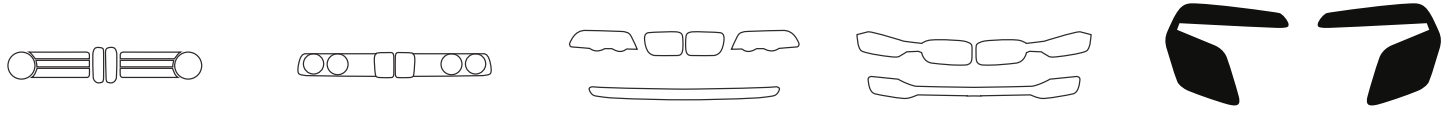


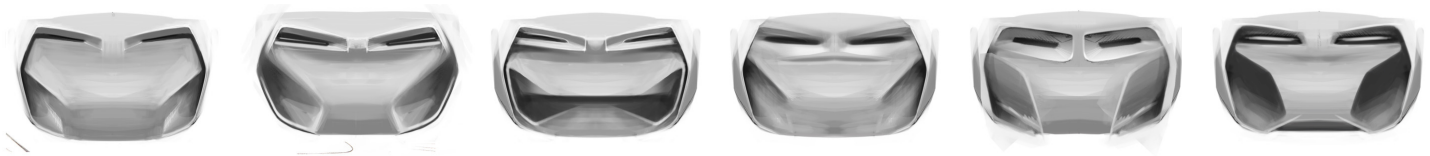
BORN IN SERENGETI AND DESIGNED FOR SERENGETI

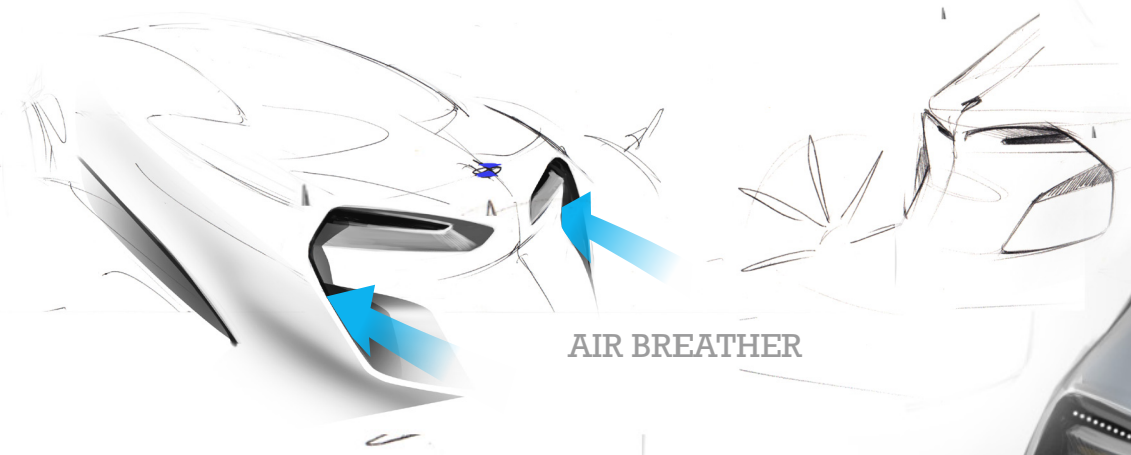


EVOLUTION OF THE KIDNEYS

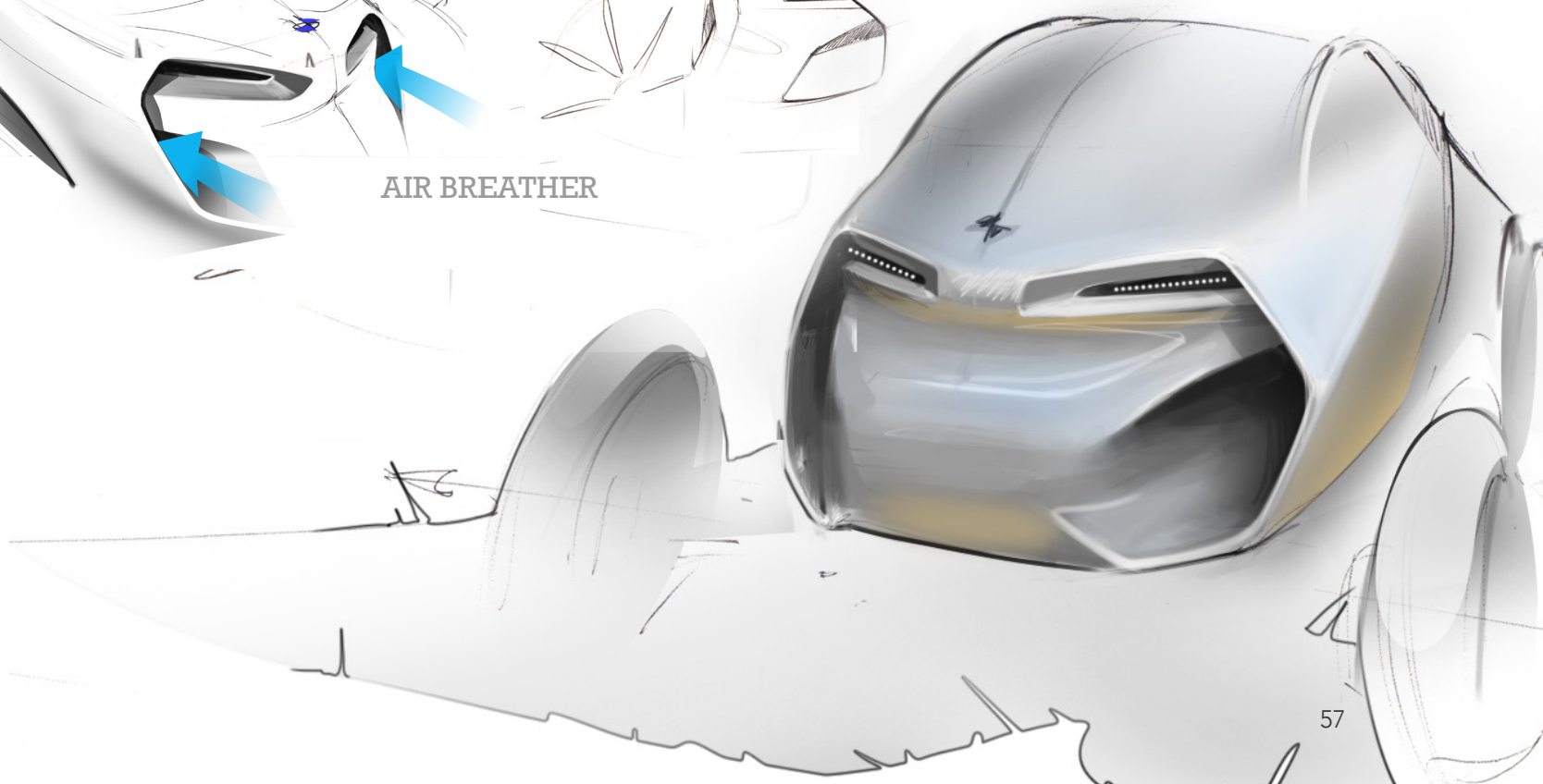
In the evolution of the BMW facemask it makes sense to use the kidneys as placeholder for the lights. Next step would be to connect the air intake to the kidneys. This would create a simple graphic which is easy to identify.

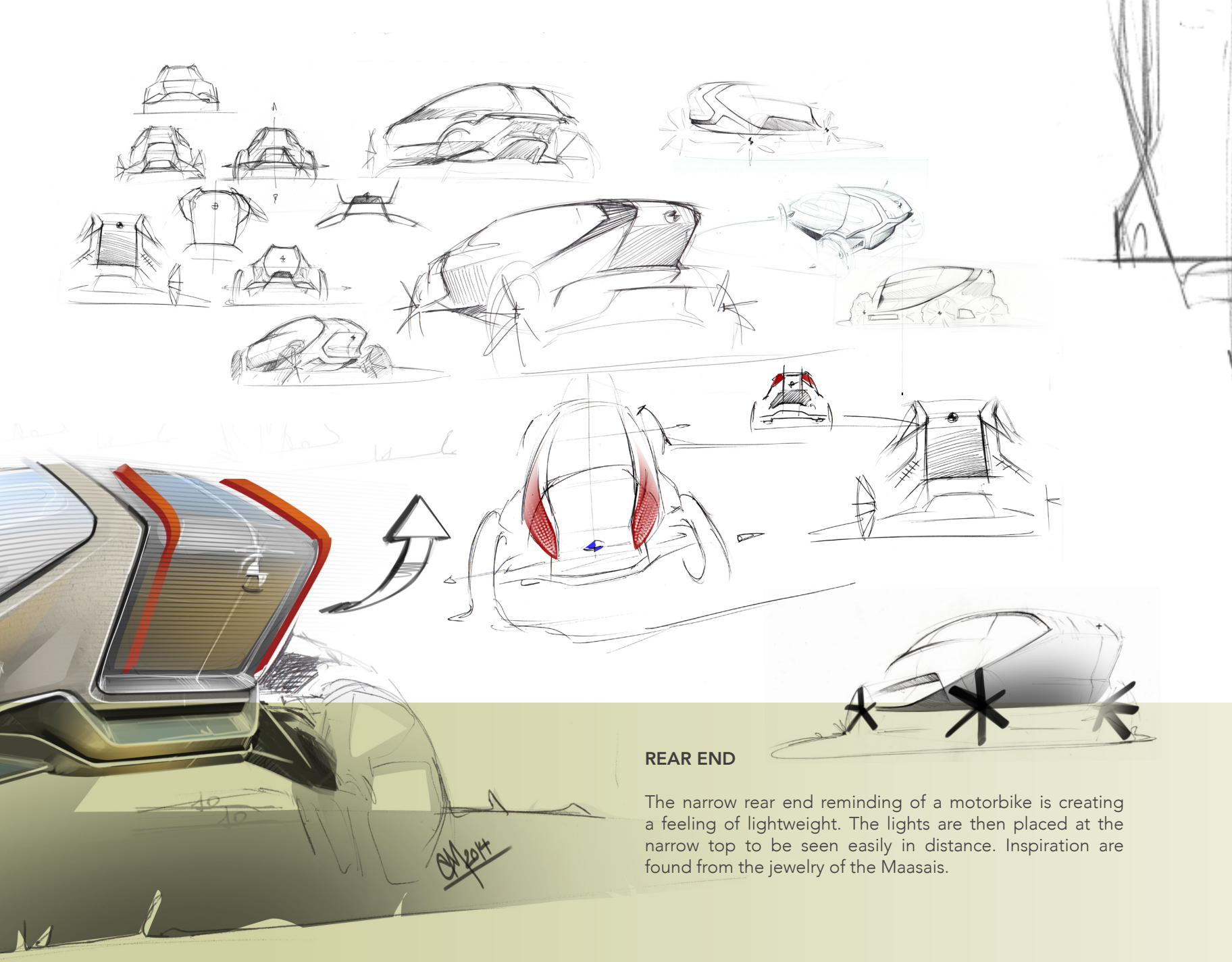






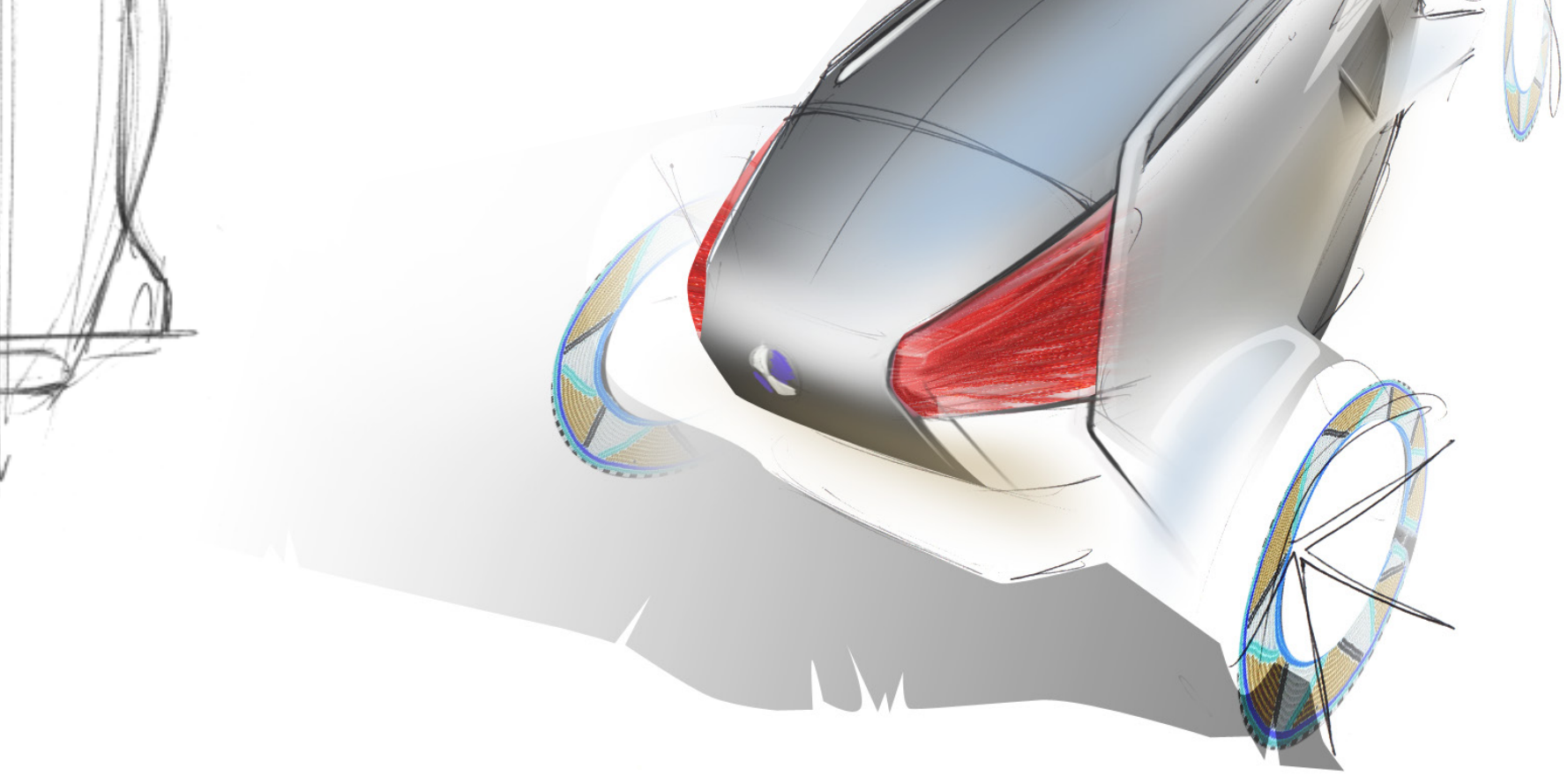
AIR BREATHER

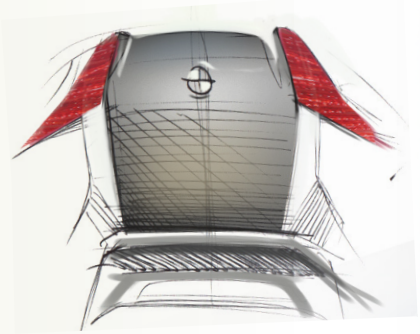


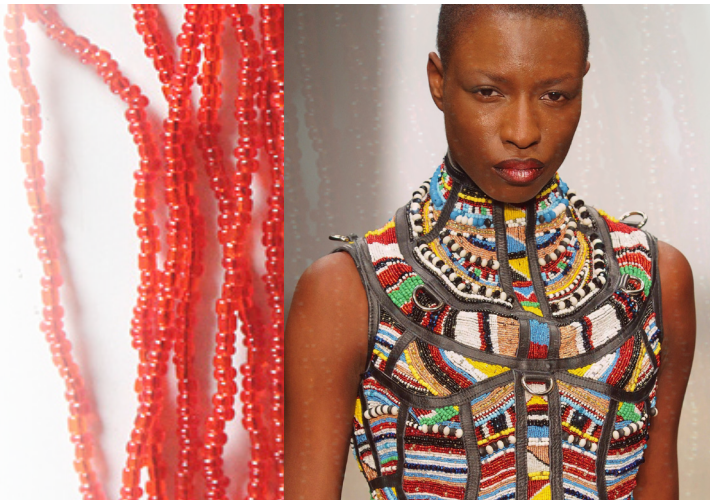


REAR END

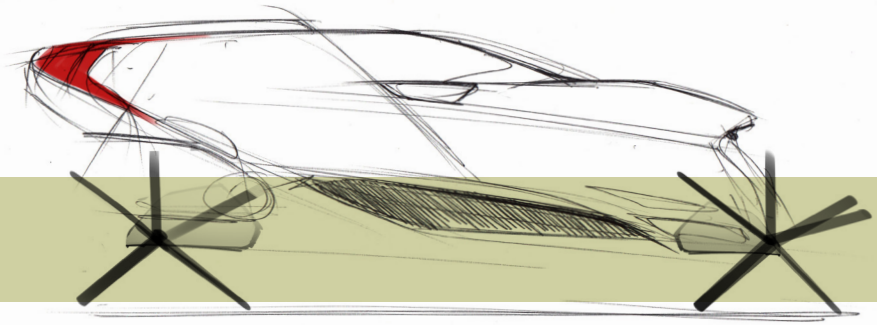
The narrow rear end reminding of a motorbike is creating a feeling of lightweight. The lights are then placed at the narrow top to be seen easily in distance. Inspiration are found from the jewelry of the Maasais.







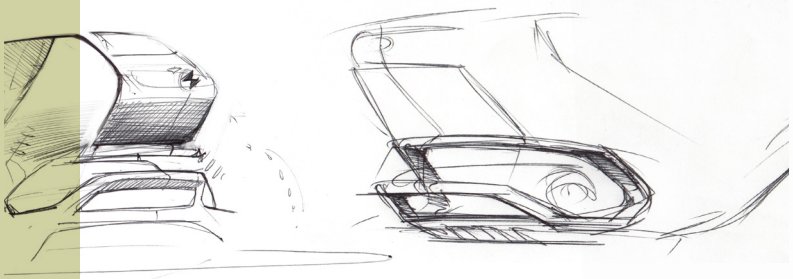
3.3.4 TECHNOLOGIES

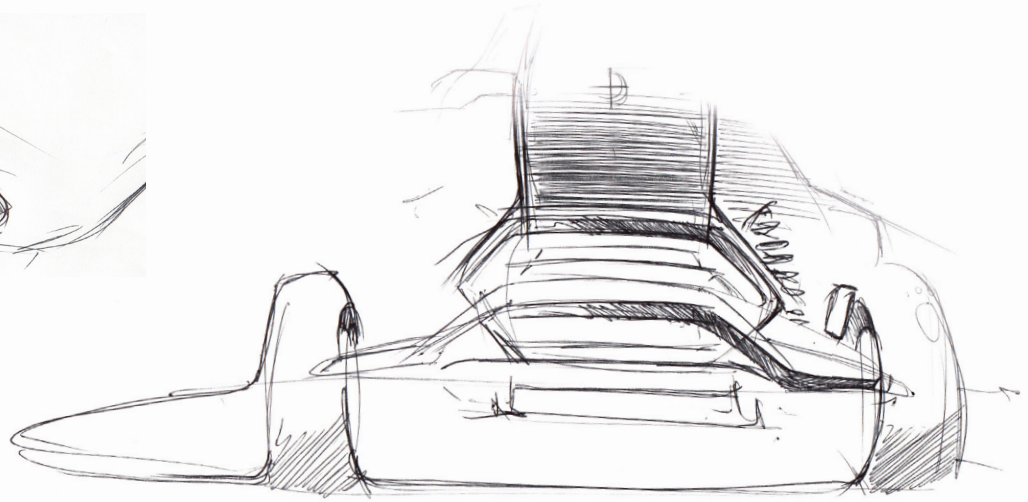


EASY ACCESS AND
ALLOWING MODIFICATIONS

POWER TRAIN

The vehicle is allowing different power trains. Depending on usage you can have electric motors in both rear and front or only on of the chosen options. There are also possibilities to upgrade to new power train technologies or combustion engines. Things can easily be repaired and exchanged because of smart design and good access.

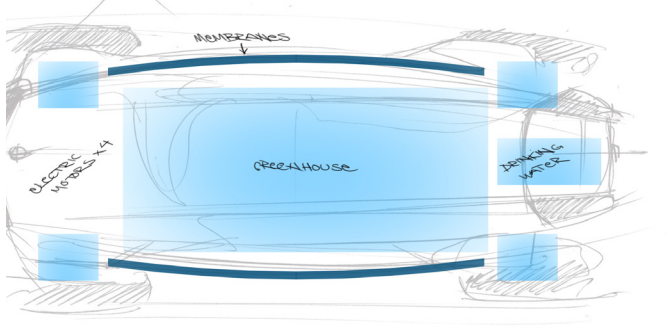




UNLIMITED ACCESS TO COLLECT
ENERGY FROM THE SUN

PHOTOVOLTAIC POWERED

Super efficient solar panels will power the vehicles motors. The energy which are collected during the day will be enough for normal usage. The electricity can also be shared to other purposes as well in the village or other situations. The energy is stored in super capacitors printed on the back side of the solar cells.

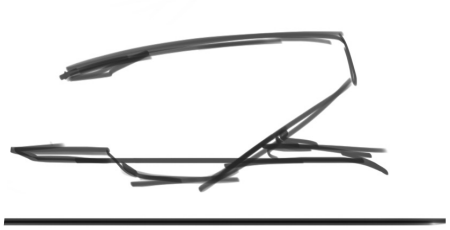


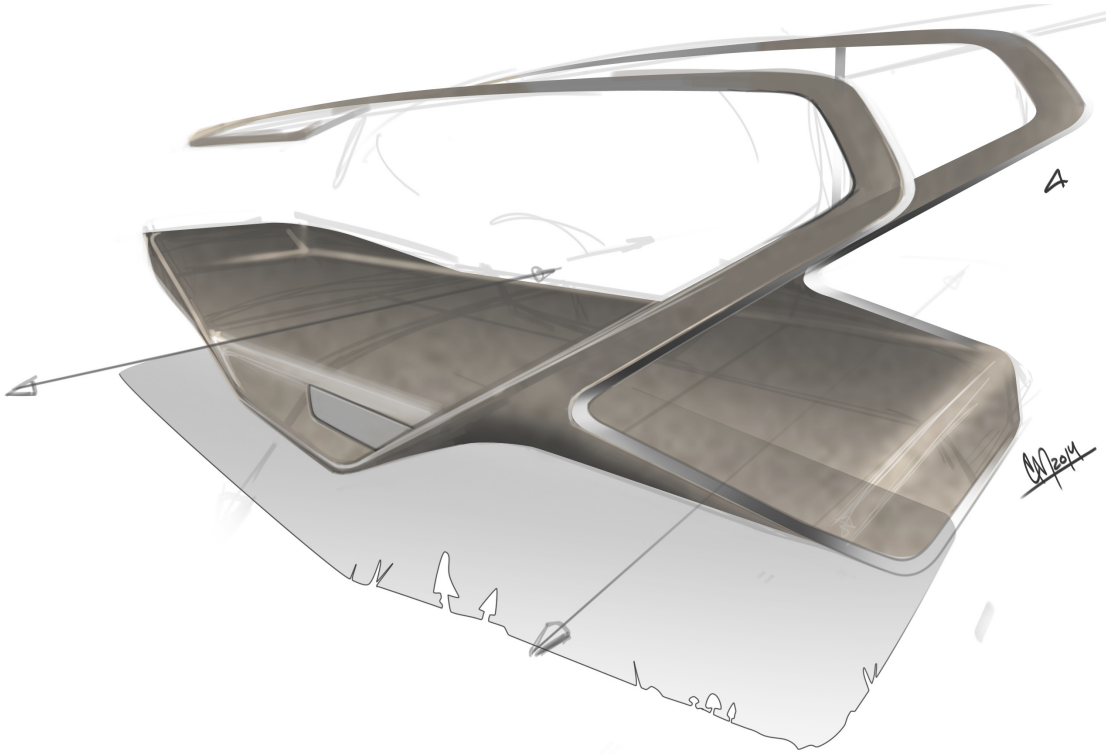
SELF SUFFICIENT COOLING SYSTEM

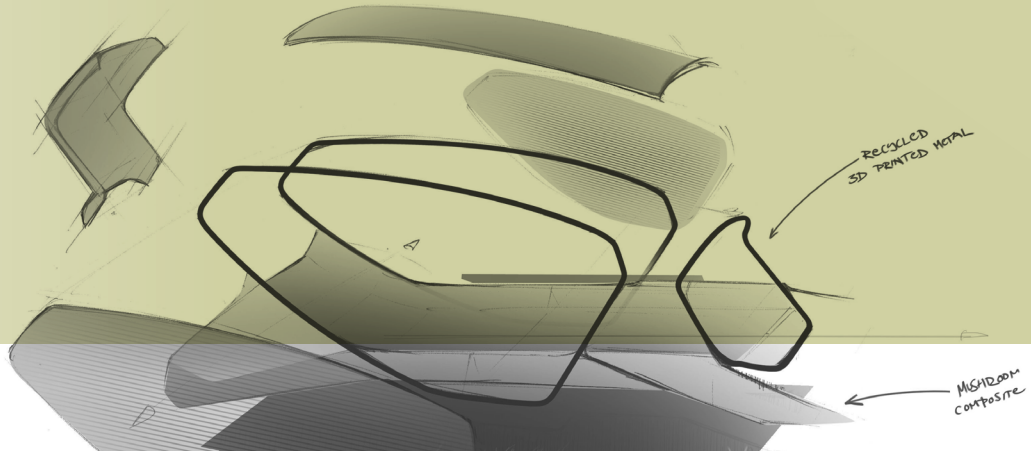
The vehicles climate system is self-sufficient by using fog harvesting technology. By collecting water from the fog the vehicle is able to cool the green house and electrical components during usage.

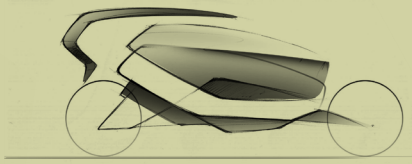
MYCELIUM COMPOSITE AND 3D PRINTED SKELETON

The main body will be made out of mycelium composite which is reinforced by a 3D-printed skeleton. The skeleton structure is improving the performances and makes the vehicle more durable in rough conditions.

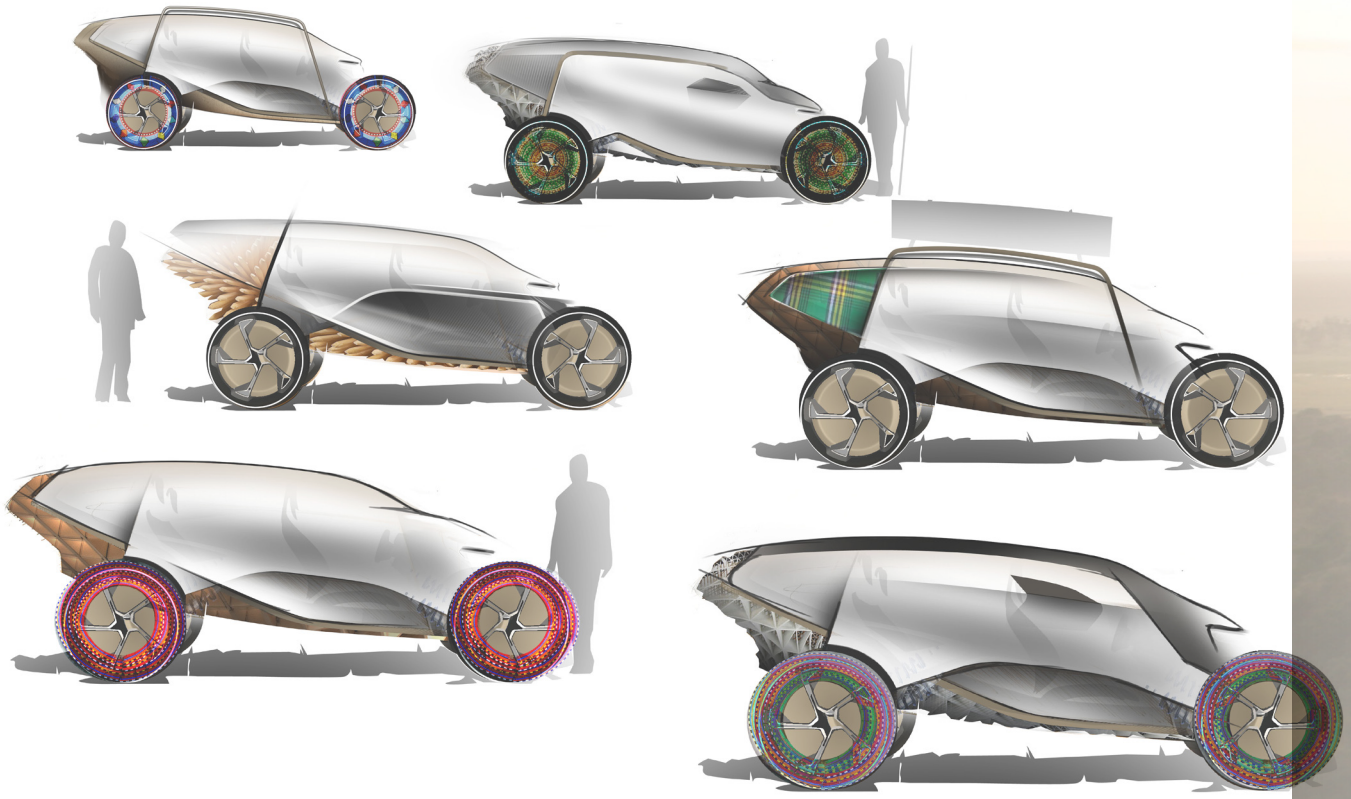






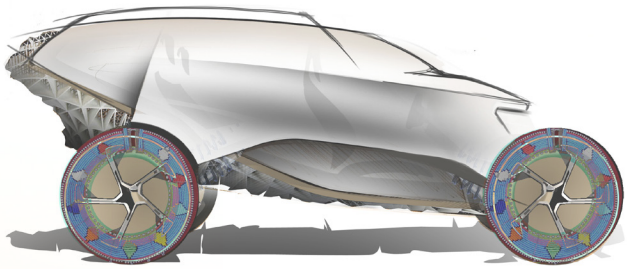


3.3.5 DETAIL DESIGN

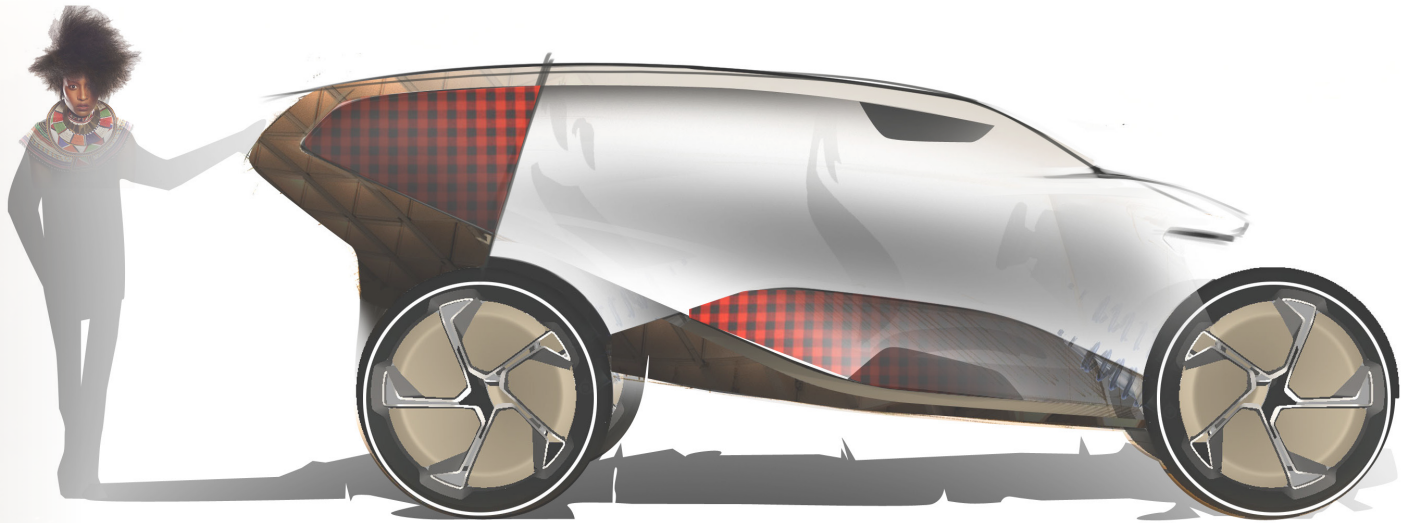


VISUAL SUSTAINABILITY

In the final design it was as important to show “visual sustainability” as well as visual handicraft.



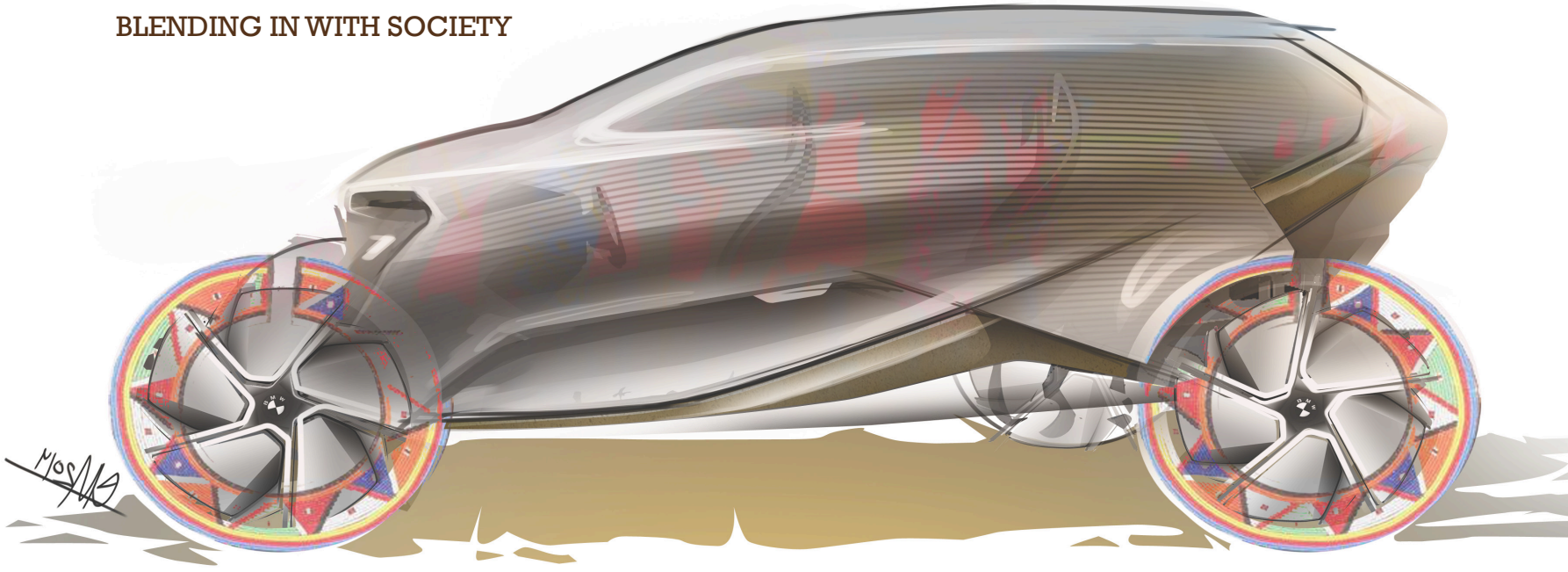
DESIGN DIVERSITY



INTERIOR CONNECTING TO EXTERIOR

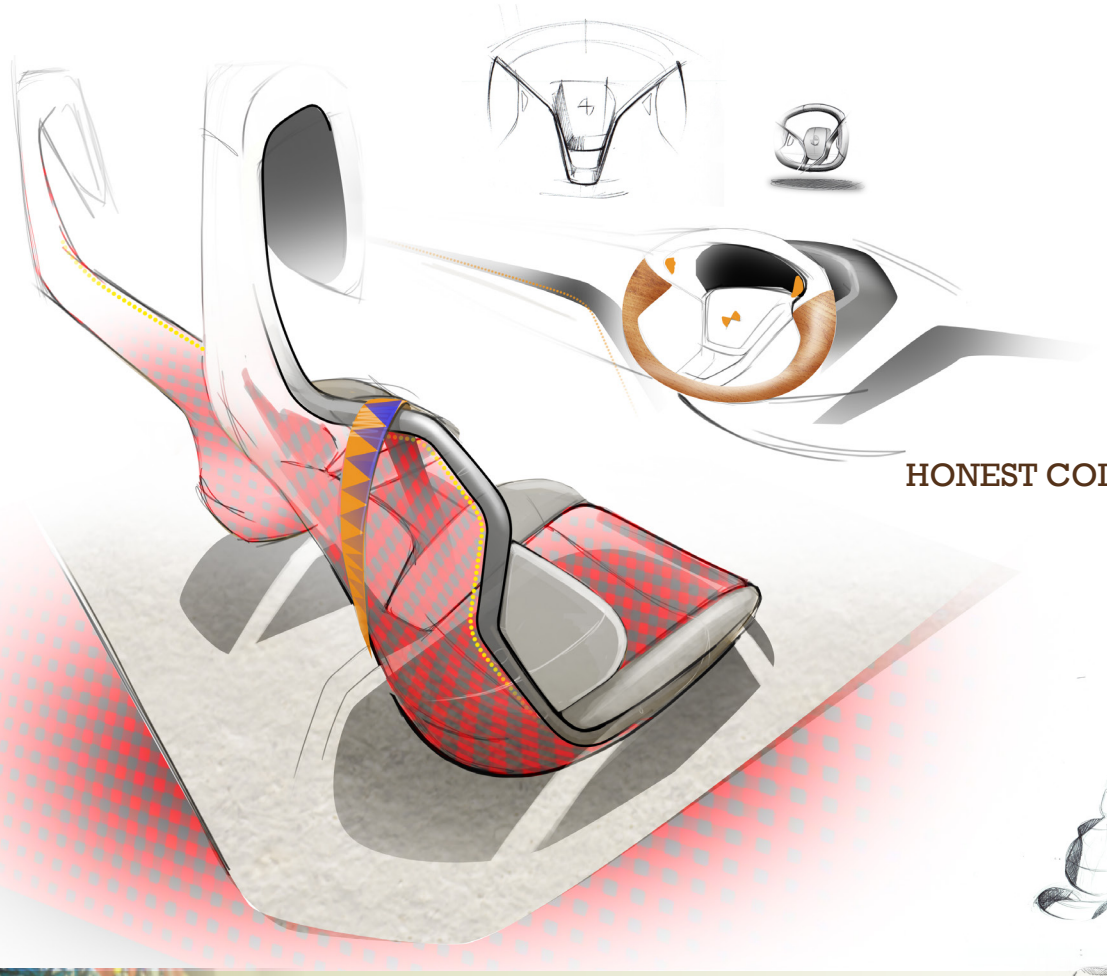
The interior will be visible from outside. So the people who are driving proudly can show from which tribe or area they are coming from with different pattern signatures.

BLENDING IN WITH SOCIETY



DECORATED RIMS

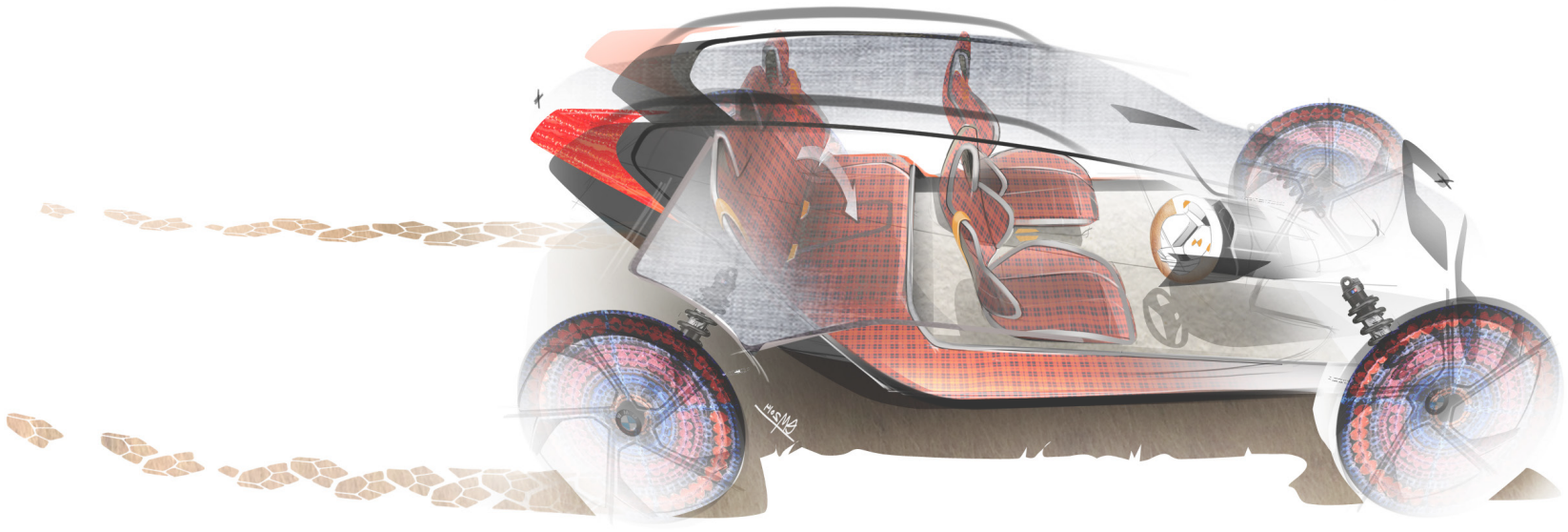
The rims/spokes are decorated with local craftsmanship showing status and origin. This could be an alternative for their decorated shields which are not used much today.



HONEST COLOURS AND MATERIALS

HANDCRAFTED INTERIOR

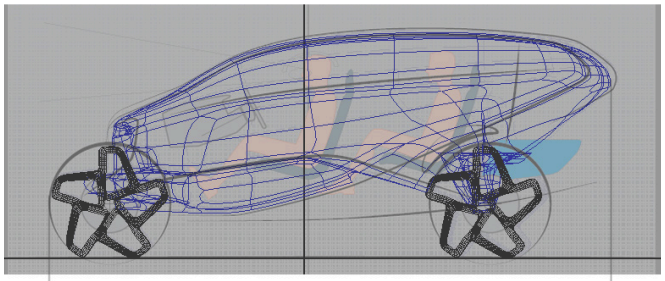
The interior is made with local manufacturing methods, using handcrafted and traditional materials allowing the user to express their culture and tribe.

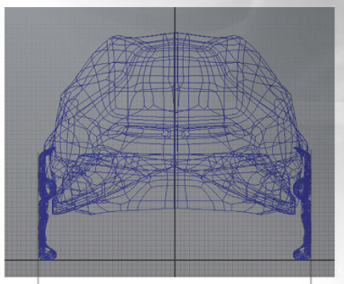


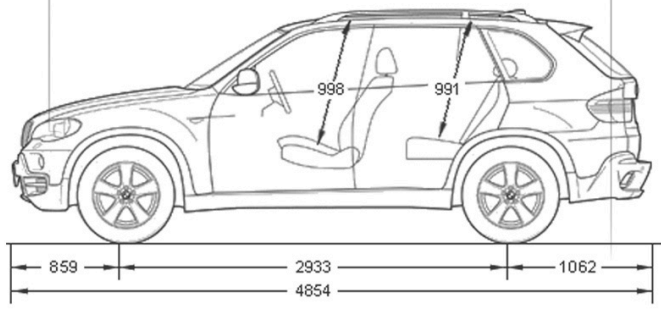
NO HUMAN FOOTPRINT

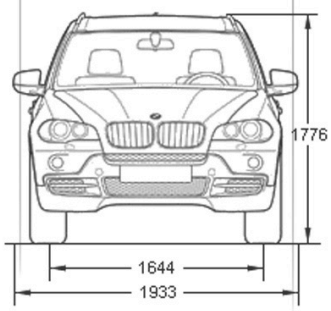
The idea of not leaving any trace, the cars tire treads are making tracks of a lion and therefore does not leave any human footprint while driving in the fragile nature.

3.3.6 3D MODELING



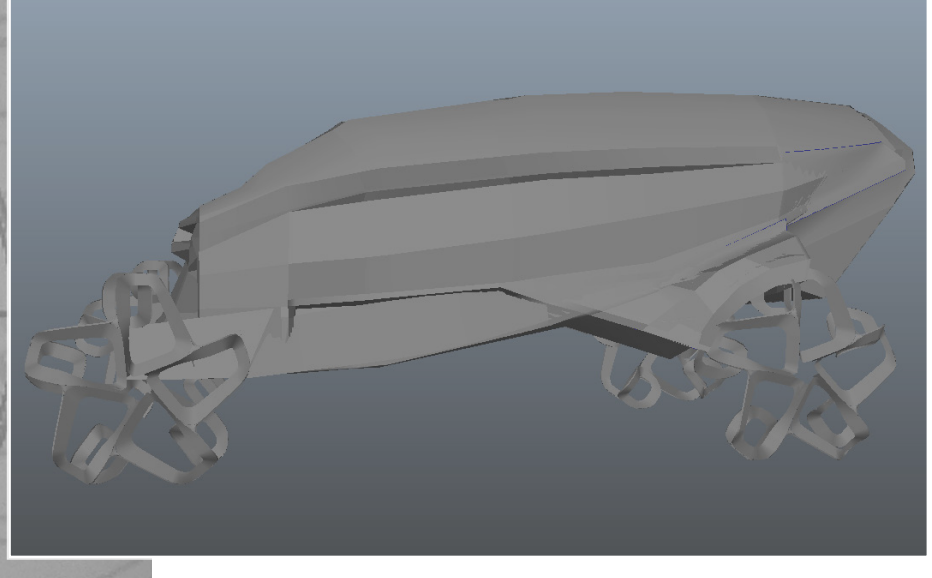


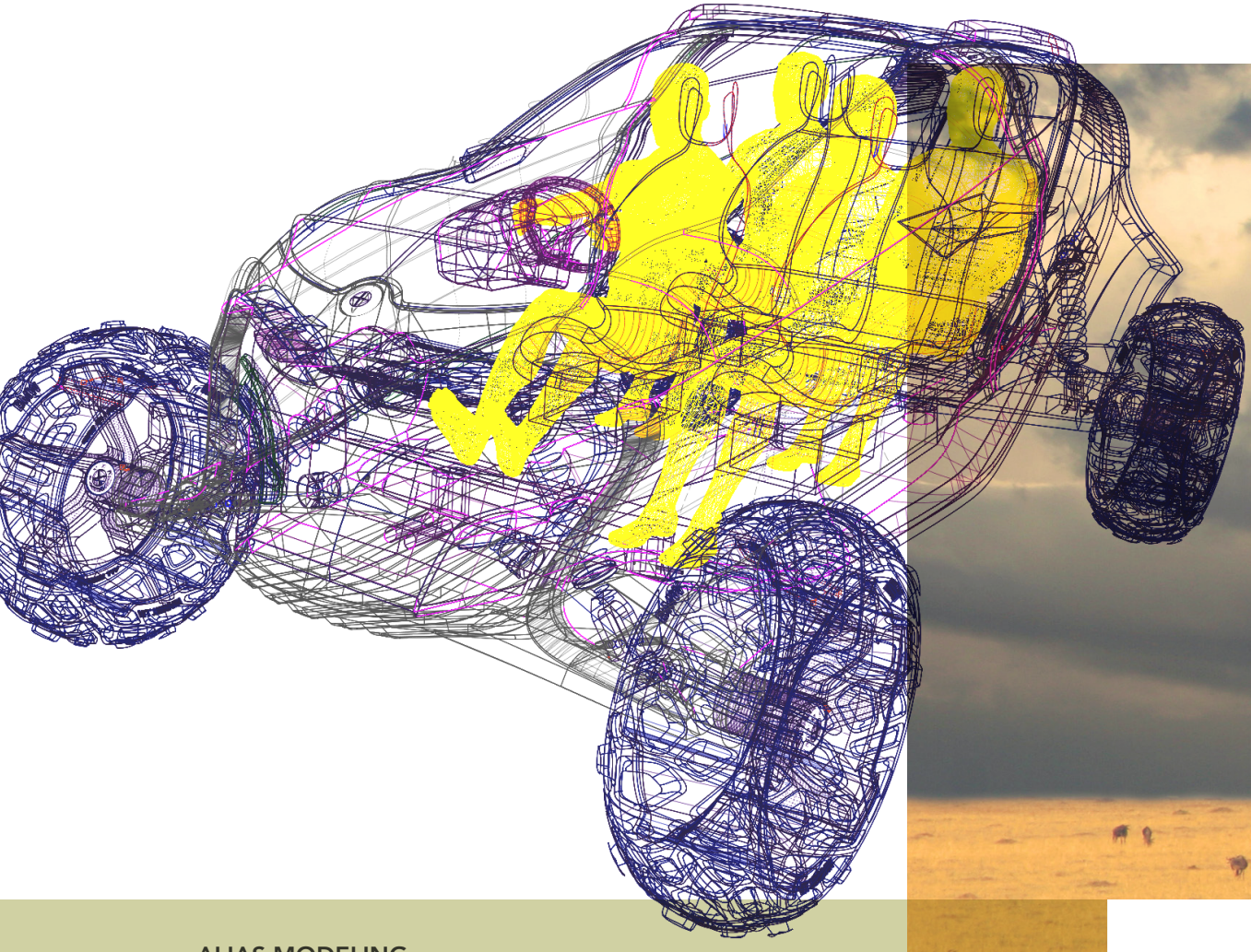




MAYA MODELING

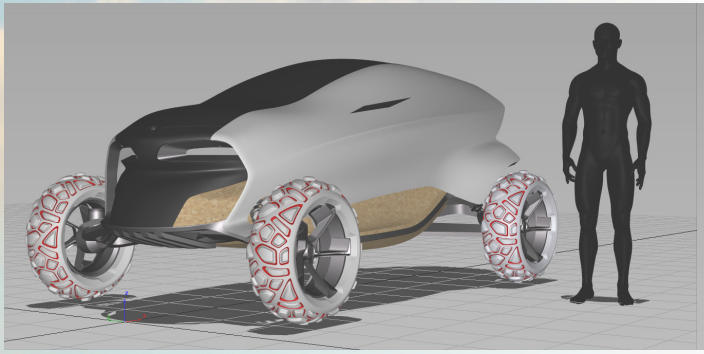
A simple model was made with the 3D software Autodesk Maya to check the volumes, dimensions and if the package was reasonable.

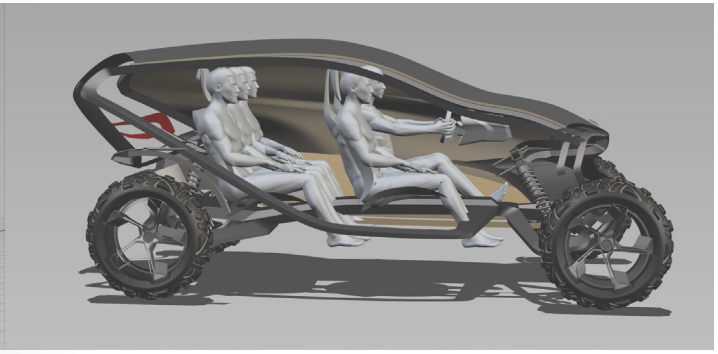




ALIAS MODELING

The final refinements of the design was made in Autodesk Alias Automotive. The vehicle was also prepared for prototyping so all parts could be manufactured with 3D-printing as well vacuum forming.





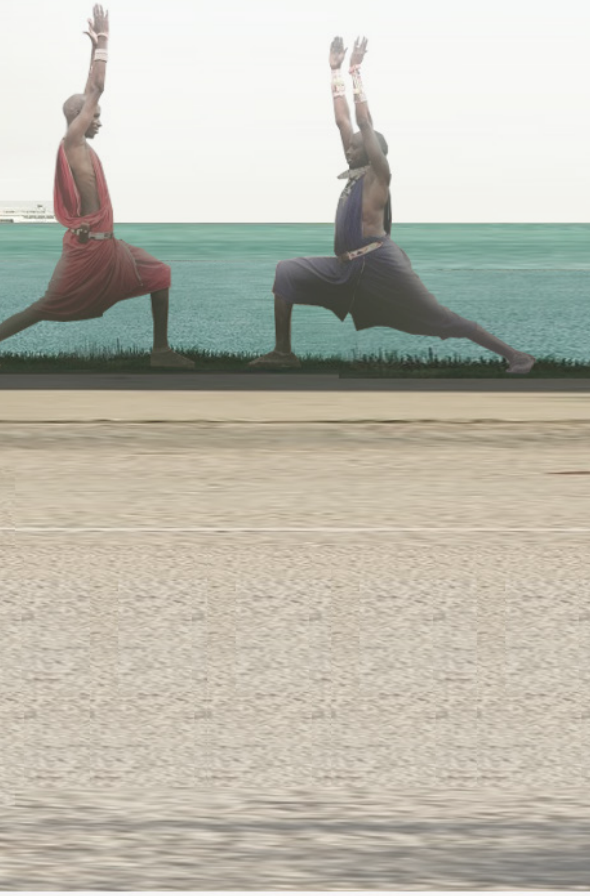
4 RESULT

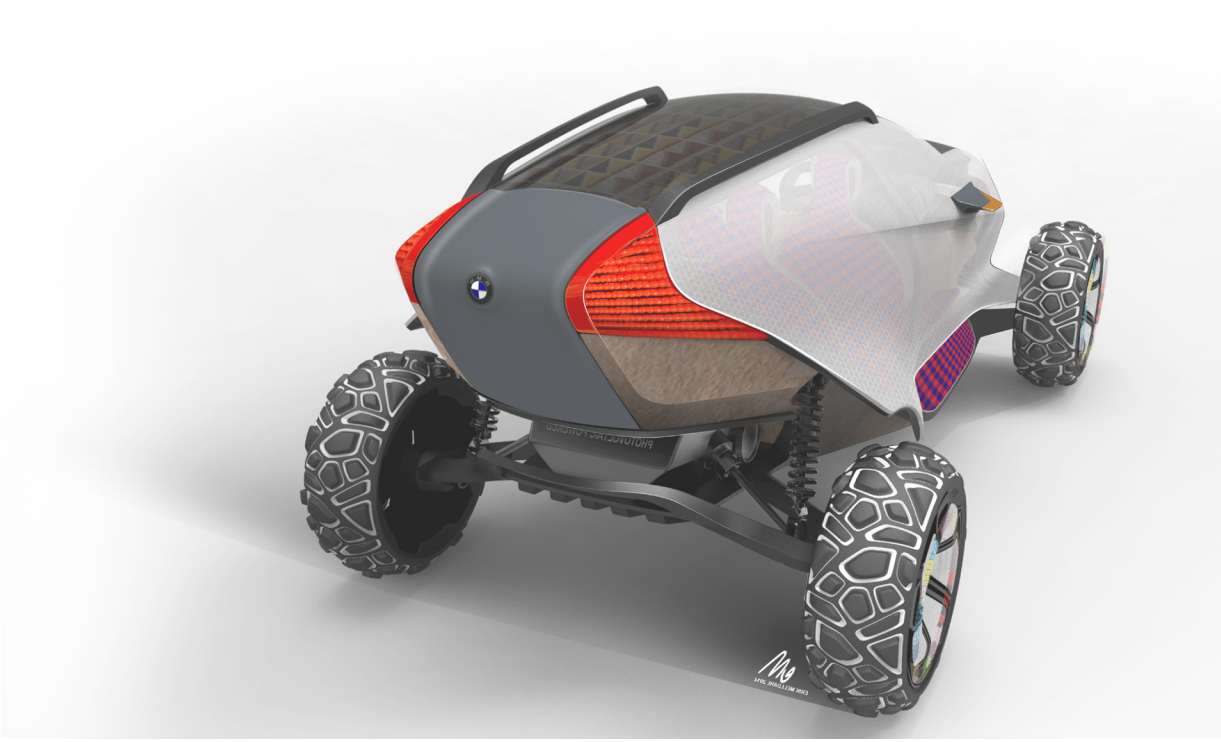
Massaica is a contextual concept vehicle, which is meant for the Maasai tribe in Serengeti. However, the story of the Maasai's is similar to many other fragile habitats which are facing the challenges of urbanization. Therefore, similar concepts could be developed for other traditional societies around the world. However those concepts would have to be adapted to those societies needs and cultures.

4.1 FINAL DESIGN

The name Maasaica comes from the lion species in Kenya called Panthera Leo Masaica.

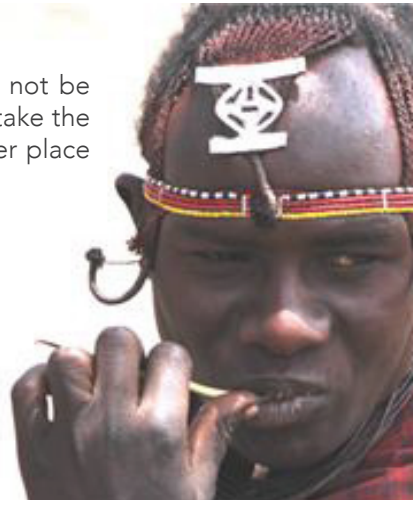

PHOTOVOLTAIC POWERED
ERIK MELLDAHL 2014

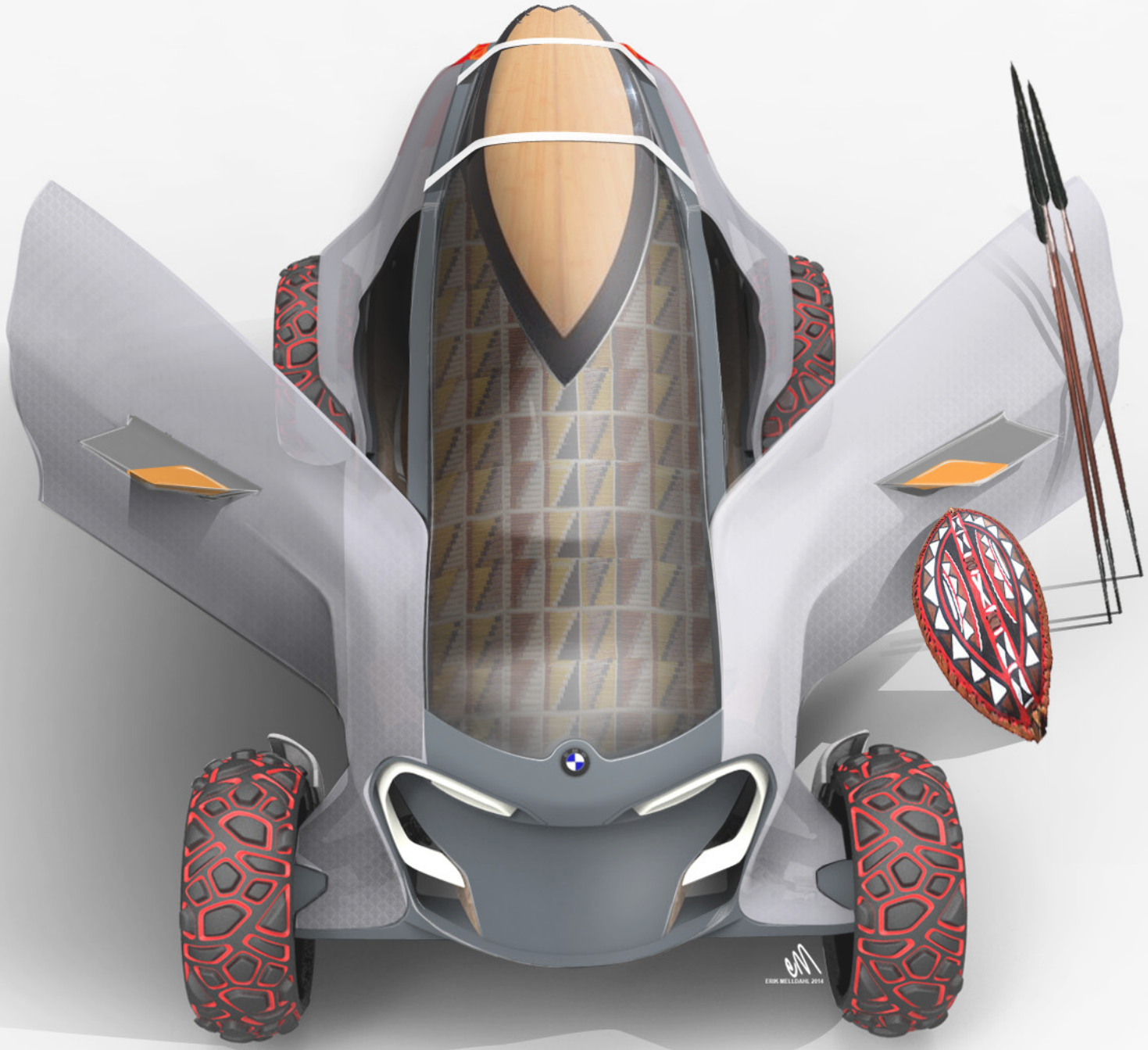




ADAPTING AND LEARNING

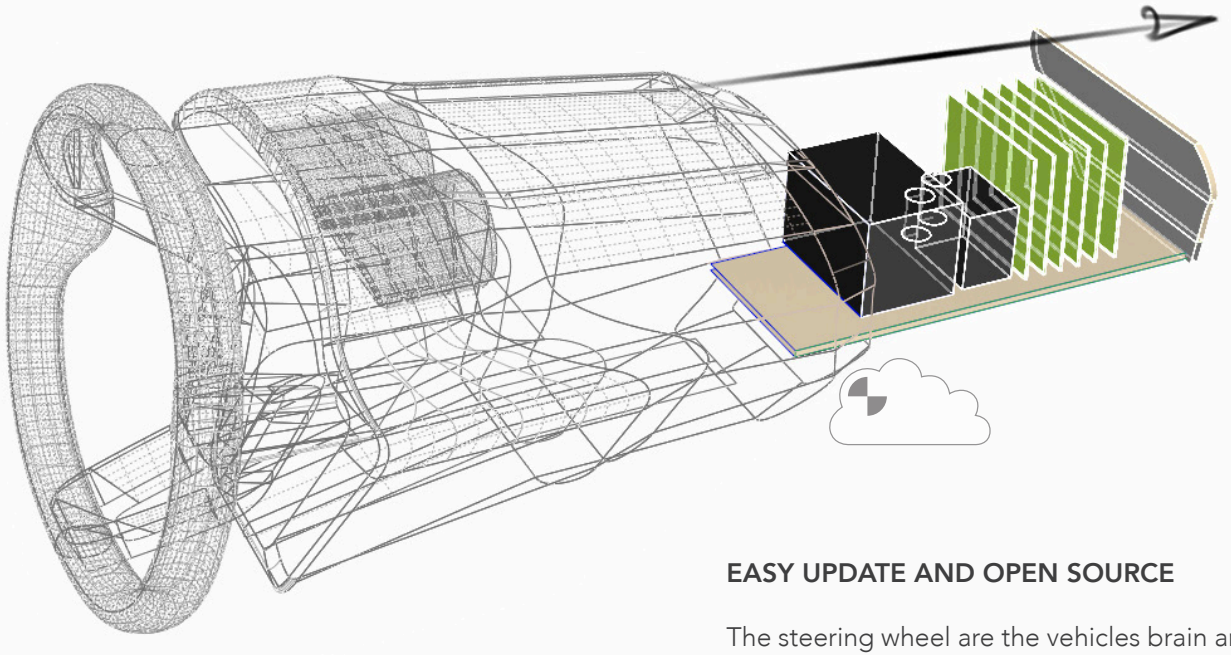
We are all living on the same planet and therefore we should not be afraid of new cultures and different traditions. Rather learn and take the advantage of each others different knowledge to create a better place for everyone.




ERIK MELLDAHL 2014

LOCALLY 3D PRINTED SKELETON

DEGRADABLE MAIN BODY

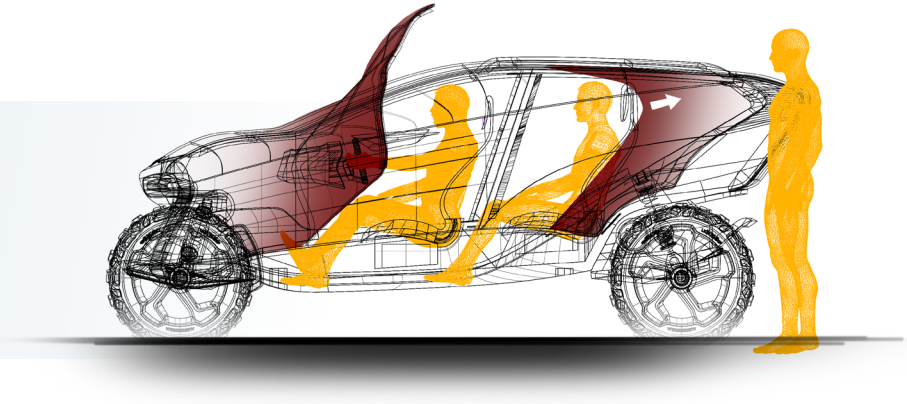


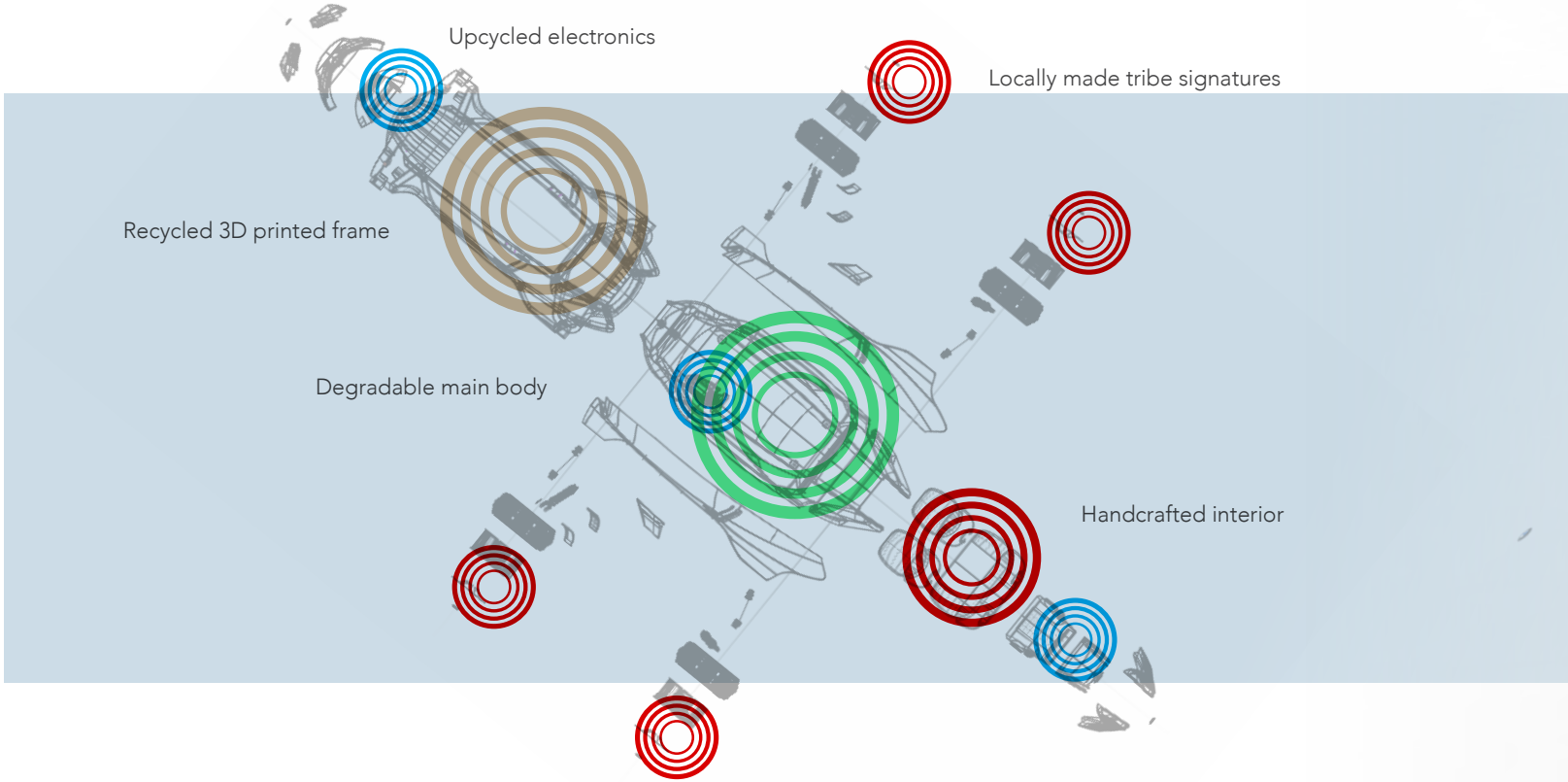
EASY UPDATE AND OPEN SOURCE

The steering wheel are the vehicles brain and are connected to the Cloud. It has open source and can easily be updated with hardware and software for further development and different needs.

REAR ACCESS

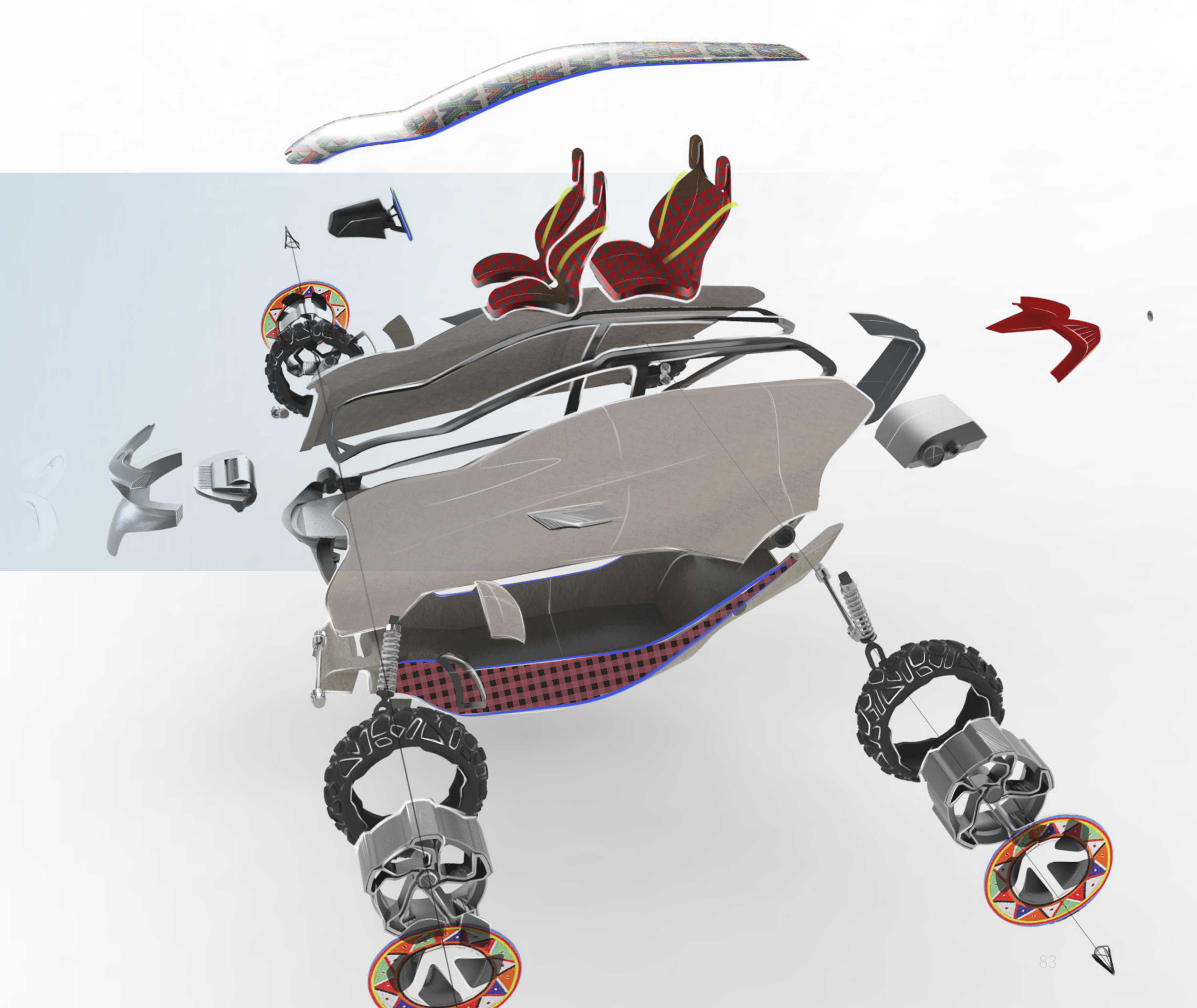
By pulling the membrane backwards you can easily access the rear seats.





REUSE, RECYCLE AND REDUCE

The vehicle is made of reused and recycled materials, with sustainable resources and new manufacturing methods. A process which are monitored by BMW to achieve as small impact in the society and in the environment as possible

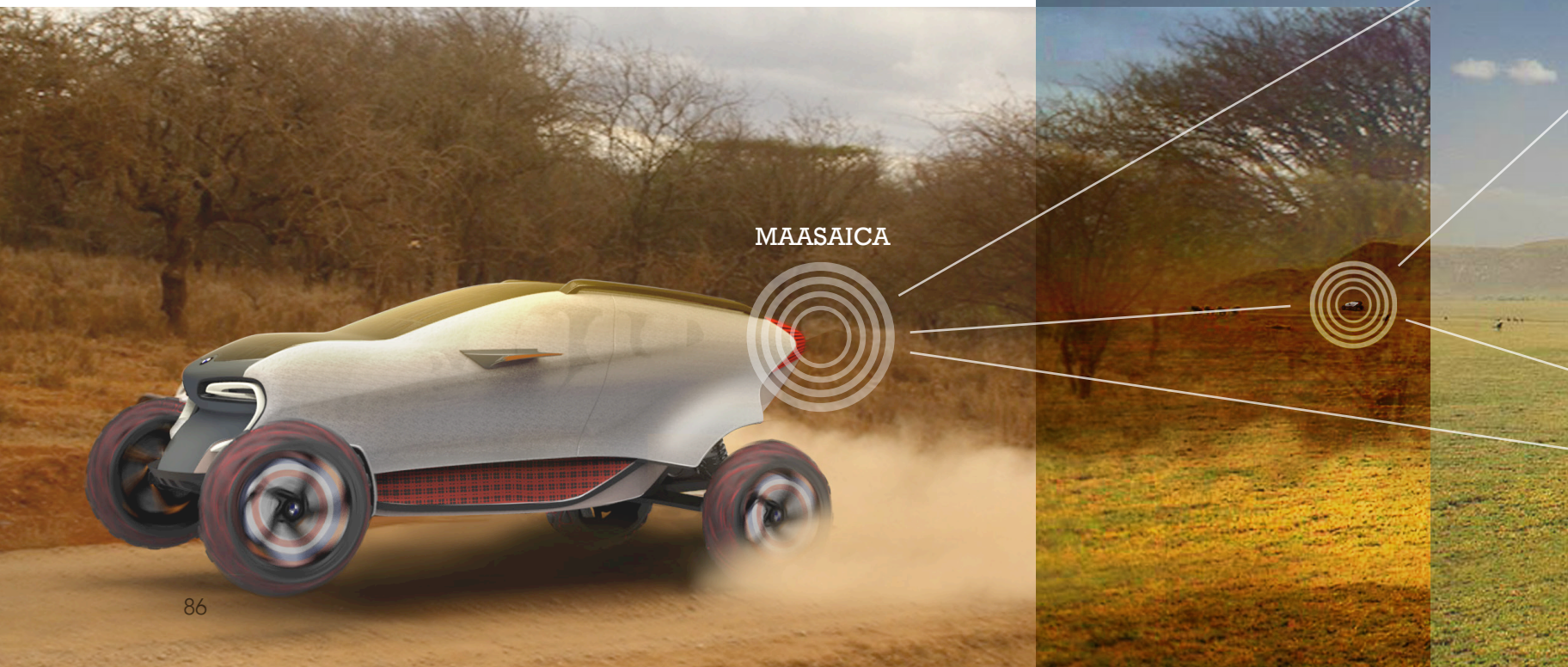


MORE THAN MOBILITY

During the night, Maasaica is parked close to the Boma collecting water through the fog. The vehicle is also connecting the households to the Cloud network.

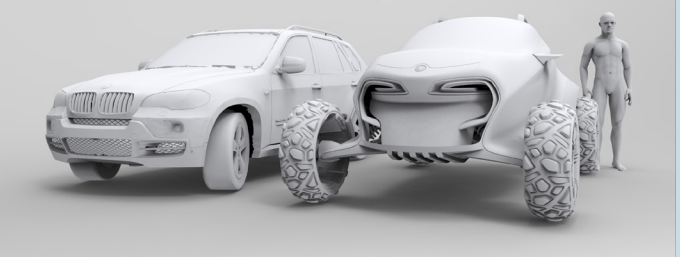
CONNECTED 24 / 7

A view of how Serengeti in 2040, when several Maasai vehicles are supporting their daily traveling and herding, guided and supported by the dynamic infrastructure.




BOMA
LOCAL FACTORY

BMW X5 COMPARISON

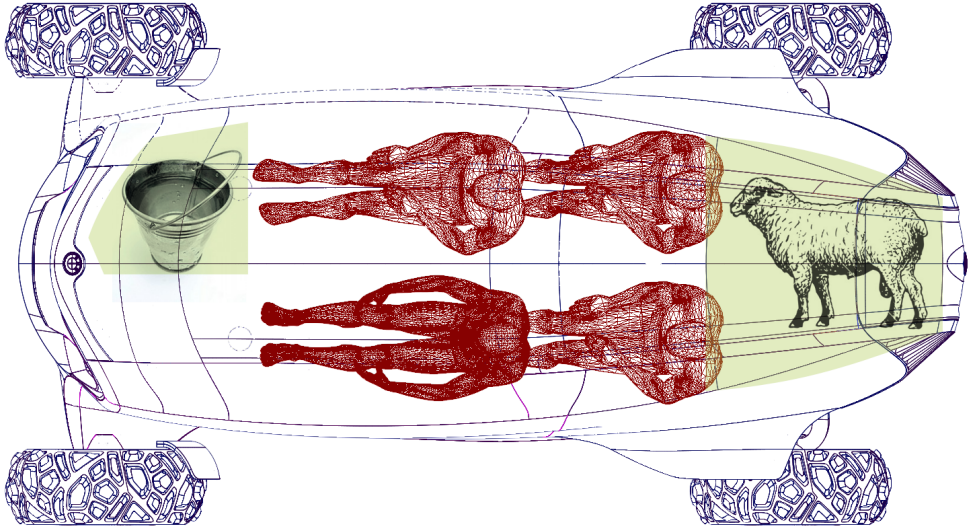


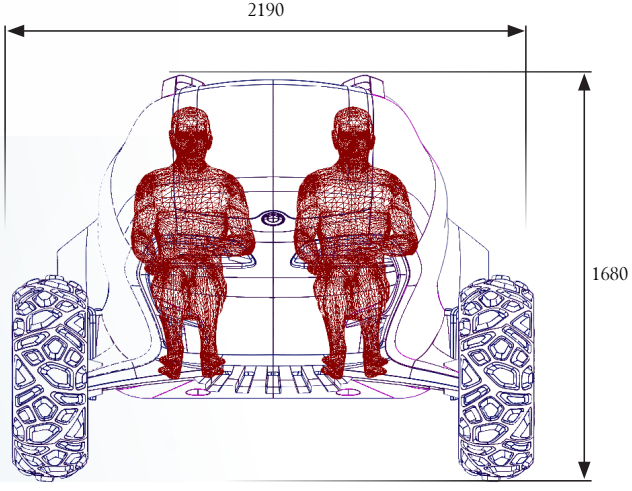
ZERO HUMAN FOOTPRINT

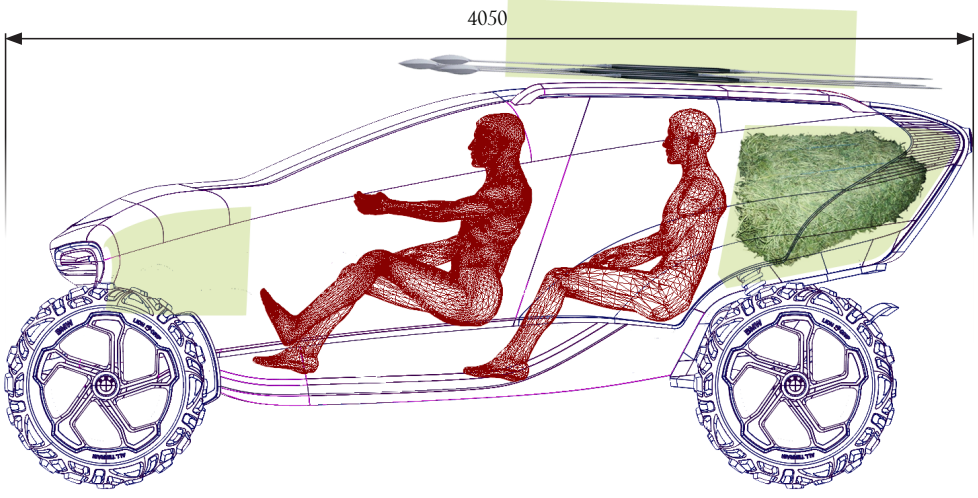
PACKAGE DRAWING

Because of the architecture which does not have any conventional dashboard, some extra space can be used in the front.

The roof racks are enabling the vehicle to carry cargo.





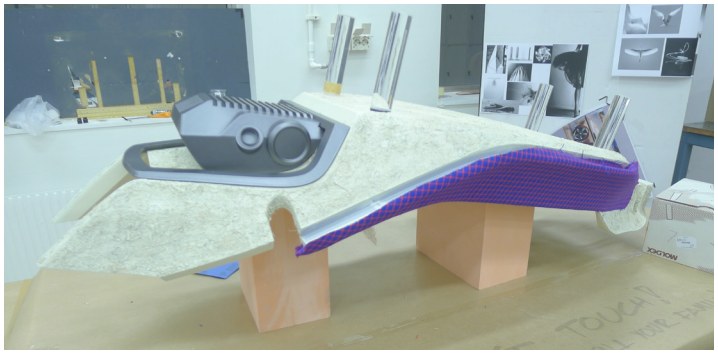


If you want to go quickly, go alone.
If you want to go far, go together.

African proverb

4.2 PHYSICAL MODEL

The physical 1:4 scale model was 3D-printed and painted at BMW FIZ in Munich. Several parts were also covered with imported fabric/bark leather from Kenya and Uganda. Final assembly were made in Umeå for the degree exhibition.



The mycelium composite imitation is made of sawdust/grass and a thin layer of paint.

Side panels are covered with a semi-transparent fabric which makes the interior visible from outside. This fabric is also representing the fog harvesting membrane.

4.3 DESIGN TALKS

A presentation was held and the physical model was shown during the degree show 5-6th of July 2014.

5 CONCLUSION

I believe...

...that everyone in the world has to take a bigger responsibility when it comes to global warming, pollution and waste. Every day there are new frightening news about the polar ice melting, new huge islands of waste found in the oceans and people fleeing because of the lack of essential things such as food and water. The way the world has been driven the last decades is definitely not beautiful and the future doesn't seem so much better if we don't take sustainability more seriously.

When our children and grand children grow up, they will question our actions and decisions. They will probably ask how could we be so negligent and not do anything about the negative trend we already knew about. All the facts where there but we did not care about it. Instead we were just thinking about earning money and consuming and not taking responsibility of the environmental costs.

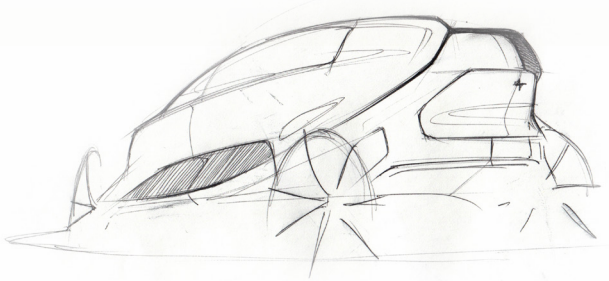
As a designer it is important for me to have this in mind when working on new products or services. I have the possibilities to early in the design process do sketches which can make a big difference when it comes to sustainability. This power is amazing and our profession has to use it. This is what has made me choose the education of car design and is what made me choose this topic for my thesis.

I wanted this project to raise questions, which can inspire people by showing that things can be done differently but still beautiful and diverse. The story of Maasaica and the final design is visualising a world where companies such as BMW take their responsibility and not only give the consumer the possibility to move from A to B, but also help out building sustainable societies which are reversing the negative trends. Recycling, reusing and upcycling our waste into mobility, fair labouring and solving issues such as water problems.

During the projects process it was important to know my limitations and daily reflect over the work to make sure that I still was following my initial idea. Keeping deadlines and making decisions was crucial and it made it possible to have two weeks of extra buffert for unexpected happenings. This was definitely needed because the CAID modeling took more time than planned.

The story for the project was a key factor and everything within the creative process had to match with the outcome from my research and ideas. There are just a few things that I would like to have done differently, mainly design features that could have been pushed to another level. But overall I am very happy with my process, result and the overwhelming response.

The future is what we make out of it.



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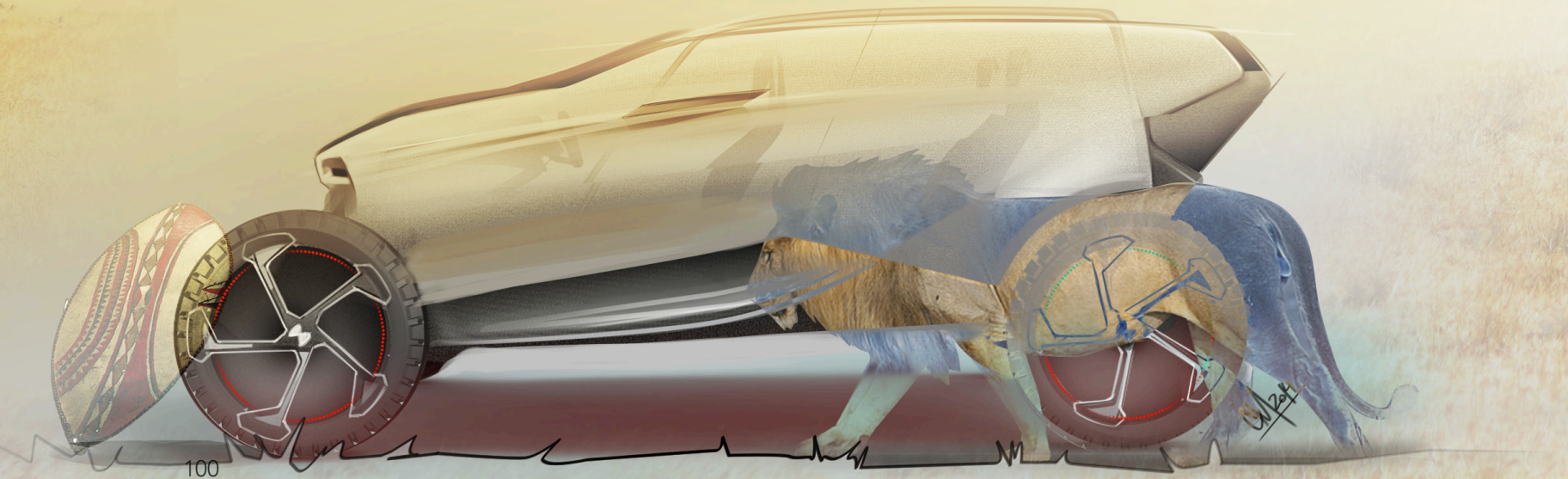
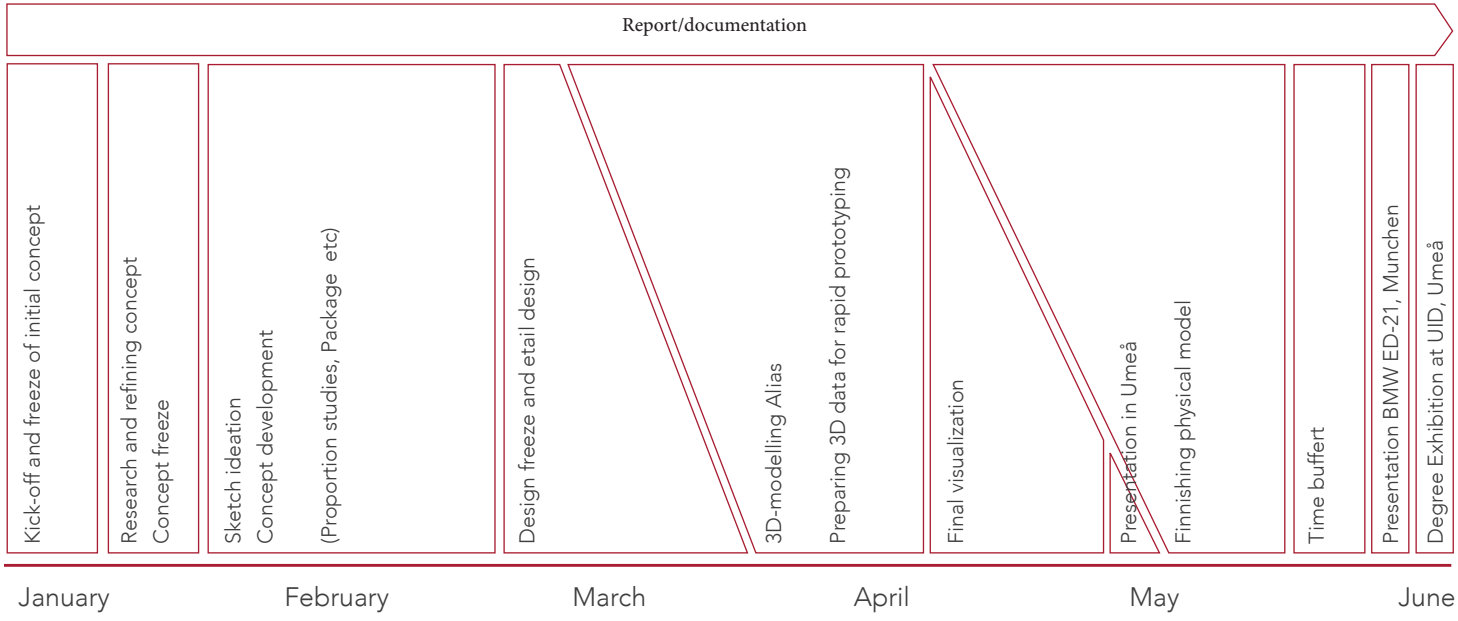
7 APPENDIX



7.1 TIMEPLAN

The thesis project for the Transportation Design programme covers 20 weeks during the fourth semester. There are several checkpoints, presentations and deliveries which has to be considered.



MAASAICA - DESIGNED BEYOND MOBILITY

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