

VALTRA

Individually Yours



THE VALTRA ANTS CONCEPT

Celebrating the next sixty years

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We at Valtra
are already
designing
the future



IN THE FUTURE farmers will still play the key role in food production, but they will have to produce more food for more people on less land. In the future more people will live in built-up areas and cities, while some existing fields will even be reforested to help conserve the environment. Agricultural machinery will have to be highly intelligent and even able to operate without constant supervision. Our research and development team has studied these visions of the future and created a concept for future agricultural machinery that will be able to handle agricultural tasks while serving people in many other ways as well. One thing won't change: in the future our customers will still want to tailor their agricultural machinery according to their individual needs in order to perform specific tasks as efficiently as possible.

VALTRA TODAY serves its customers from the moment of sale throughout the lifespan of the tractor. We deliver spare parts, and our service technicians visit thousands of farms a year. In the future many of our services will be highly automated, but people will still be needed to oversee operations. Our service technicians will continue to visit farms to carry out tasks that cannot be performed at our automated service points. So step into the future with us and find out more about our vision for the future of agricultural machinery.

Read more of future at www.valtra.com

Farms in the future

Will farms still be farms in the future?

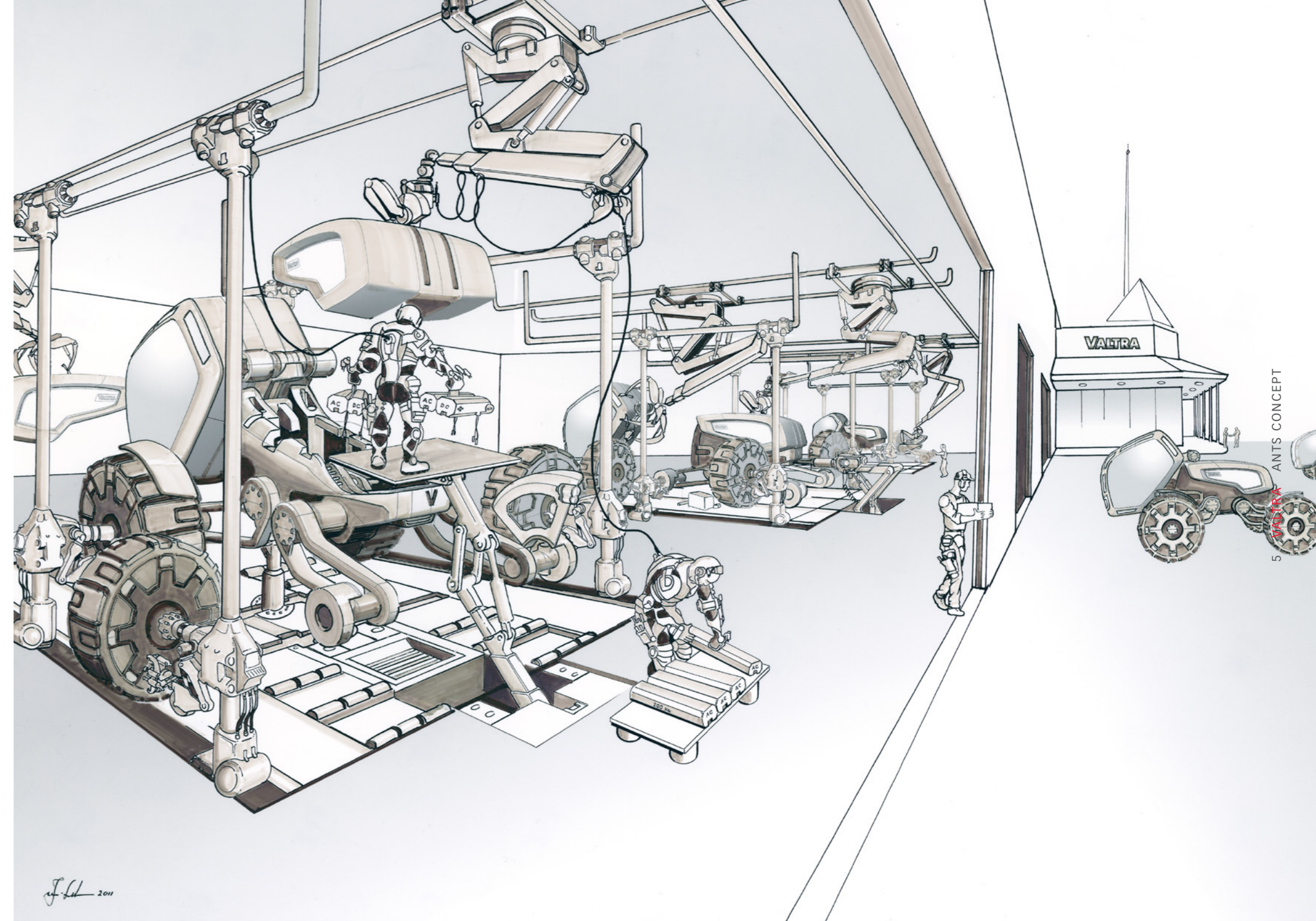
In the middle of this century the world will be inhabited by 9 billion people, and the amount of cultivated land will have been shrinking for several decades already. Up to 80 percent of all people will live in built-up areas and cities, so farmers will have to feed a growing number of people on a diminishing amount of land. This trend is placing incredible demands on agricultural efficiency and food production. What kind of countryside will be able to meet these challenges, what kinds of crops and livestock will be needed, and what kind of farmer will be needed to save the world from famine?

IT IS CLEAR that the farmer of the future will have to be a highly trained visionary. The decisions that farmers make will have a direct impact on how the people of the world overcome their everyday challenges. Although consumer spending patterns will change over the decades, people in 2050 will still have to eat every day – vitamin pills and energy drinks will be no replacement for meat and vegetables. The farms that produce the ingredients for food will have split into large and super-efficient farms and medium-sized super-efficient local food production units. Regions that already have a high proportion of cultivated land today will be efficiently used by large farms in 2050. Tens of thousands of agricultural machines will automatically cultivate hundreds of thousands of hectares of land, whose harvests will be delivered to enormous production plants. The crops being cultivated will be

the product of human and natural development, and their properties will be selected to ensure even quality, continuous growth and a sustainable harvest. Farms will produce mainly food, food ingredients, energy and raw materials for energy production. More meat will be consumed than ever before, and its production will be highly automated. Poultry will account for a larger share than pork and beef for reasons of production efficiency. The breeds raised on large farms will be specially selected to offer the ideal livestock properties. Some farmland will have to be reforested to help clean the climate, while existing forests will be protected to save the planet.

In many regions of the world healthy local food will be produced in the immediate vicinity of residential areas. These independent and self-sufficient agricultural production units will be owned and operated by families. They

will operate independently of their surroundings and serve as vital sources of energy and food. These farms will produce high-quality and highly refined foods and clean ingredients for feeding people. The average size of these farms in 2050 will not have grown significantly due to the scarcity of land, but their production technologies will be much more automated. Farming conditions and soil properties can be controlled regardless of the time of day or the time of year. Meat production will be focused on high quality and a high degree of processing. These farms will produce local food that is delivered to the surrounding area and sold directly to consumers. These farms will be major energy providers for the local neighbourhoods, producing solar power, wind power and bioenergy. All municipal and farm waste will be converted into energy. The machinery employed by these farms will serve all



Farms in the future

Twice as much capacity when a cabin isn't needed



the needs of the farms and their surrounding areas, and the people working on these farms will be highly trained pillars of society, as they are today.

The boldest visionaries see the farms of the future as integral parts of the urban environment, with 30-storey farms that cover entire city blocks producing vegetables and fruits and raising poultry for up to 50,000 people nearby. Powered by solar energy, these farm towers would use robots to look after the crops and reap the harvests. The robots would also handle all the processing and distribution. Such urban farms would be located in large cities, and all the waste they produce would be used for energy production. In addition, they would help remove hazardous emissions from the urban air. These "waste in, food out" farms would serve as local food producers within cities. Their supervisors would work

from their own farms and only visit the urban units as needed. The same people would also look after the city's parks, where the trees and shrubs would also help clean the air while providing a natural environment for urban dwellers. All the technology that would be required for such urban farms already exists and has been tested in various forms, so it could be only a matter of time before the first urban farms are introduced in large cities.

All around the world the farmer of the future will be a highly trained professional who operates a multi-branch production plant whose products are designed to meet the needs of people and the infrastructure. Large farms will be able to manage tens of thousands of hectares of fields, thousands of cows and pigs and millions of chickens with a small workforce and highly automated machinery. These farms will produce a large amount of

energy for entire cities, and everything will be managed with industrial precision. Smaller farms will be operated by families specialised in providing products, services and energy for local needs. The highly trained professionals working on these farms will also look after urban blocks and parks. For all of this to work, humans must be assisted by smart machinery and equipment, as well as reliable automation. Nanotechnology will also be employed to study soil properties and ensure optimal conditions. Farms as we think of them today will no longer exist. Instead, they will have developed into professionally managed production units, some run by families and others by companies. All farms in the future will be managed with ultimate precision to minimise financial and environmental risks.

The products, services and energy provided by large farms will be marketed

globally. Their value will be measured in real time on global agricultural exchanges. To succeed in these global markets, not only farming techniques but also farming conditions must be mastered in order to minimise financial and production risks. Managing the production environment remains the biggest unsolved challenge facing agriculture. Although many other problems have already been solved, complete practical implementations have yet to be seen. The profitability of smaller farms and urban farms will be determined by the law of supply and demand. There will certainly be a demand in the future for high-quality fresh local food produced in an environmentally responsible and profitable manner. In other words, the farmer, agricultural producer or agricultural production unit manager of the future will have the most respected profession in the world.

Crops will be cultivated in the future on walls, on roofs, in multi-storey buildings and in fields.

IN THE FUTURE crops will be harvested by automated machinery that can analyse the harvest and deliver it directly for further processing. After harvesting the cultivated land will be analysed, fertilised and seeded immediately to allow a new harvest in just a few weeks. Many crop products will be produced on farms. From smaller farms and urban production units these products will be distributed directly to surrounding communities. Large farms will deliver their products to large wholesale warehouses for further dispatching to consumers. Seed grains will be refined in laboratories located on the farms. The production of seed grains will be automated, and their properties will be strictly controlled to enable harvests to be continuously improved.

The agricultural machine of the future



Valtra ANTS

Valtra ANTS is a highly modular future concept tractor. Actually, Valtra ANTS is not just a tractor, it is more like a versatile platform that can be highly customized to meet the needs of a wider range of customers than those used to traditional tractor usage.



Multiple ride heights and Versatile cabin & implement placement



Valtra ANTS Concept

01

VALTRA ANTS has two different basic size units, both of the which share a similar basic powertrain principle. Each intelligent wheel has individual electric drive motors. This kind of arrangement and the lack of a traditional transmission allow alternative power sources to be employed more flexibly. The smaller Valtra ANTS 100 unit has in its basic form a battery based power source with s turbine generator backup. The bigger Valtra ANTS 200, on the other hand, utilises a biogas-electric hybrid power source. The highly modular construction of both base units allows the power source to be changed according to customer needs.

02

BOTH OF THE VALTRA ANTS UNITS share a similar basic layout. The power source is located inside the central body – battery bags in the ANTS 100 and a biogas-electric hybrid power source in the ANTS 200. It is also possible to add extra battery bags and biogas cells on both sides of the body to allow longer running times.

03

ALL OF THE WHEELS are connected to the central body via suspension arms. Each intelligent wheel unit has its own active suspension, which allows the entire ANTS unit to self level in various terrain conditions. The active suspension maximises traction, efficiency and driver comfort at all times. This unique suspension also allows the machine to control the body height and ride height. When driving at high speeds on roads (up to 80 km/h) the whole body of the machine lowers itself for greater stability and better aerodynamics, resulting in better driving characteristics, improved fuel economy and greater comfort. When driving off road and moving over big obstacles, such as rocks and logs, the machine raises itself to provide extra ground clearance. Whereas traditional tractors with fixed non-suspended rear axles sometimes have a rough ride, Valtra ANTS offers an exceptionally smooth ride. This is not only comfortable for the driver, it also provides a better working environment and platform for various implements.

04

IN ADDITION TO an intelligent active suspension, Valtra ANTS also has intelligent wheels. They have electric drive motors, and also feature an extremely ingenious mechanism that allows them to expand when needed. The Valtra ANTS unit constantly monitors various parameters related to its surroundings. For example, it recognises if the machine starts to dig into the soil or if the soil itself is soft, and it can automatically expand the wheels to almost twice the normal width to prevent getting stuck. Expanding the wheels also changes the tire pattern. When the wheels are in narrow mode they have a shallow tire pattern that is good for driving on roads and other smoother surfaces, and also provides low rolling resistance and greater fuel economy. When the wheels are expanded to the wider mode, the tire pattern changes to provide a much deeper and rougher pattern. Combined with the unique active suspension, this gives Valtra ANTS superb grip in various working conditions.

05

VALTRA ANTS does away with traditional oil-based hydraulics. Most functions have been replaced with electric motors and actuators. If traditional hydraulics are required for some older implements, the pressure can be generated using water-based hydraulics.

06

THE MODULAR STRUCTURE of Valtra ANTS is enabled by the spinal core of the central body. It starts from one end of the central body and goes through the whole machine to the other end of the central body. All the implements, including the cab, are attached to this rail-like spinal core. This means that the implement can be moved back and forth along the spinal core. In addition, the cab itself can be lowered to the ground or raised to the top of the central body or even turned 180 degrees towards the rear of the machine. There is no more need for a traditional 3-point linkage, but if it is needed for older implements it can be also connected to the Valtra ANTS spinal core.

Multiple power options

07

THANKS TO the highly flexible implement attachment system, the rotating cab and four-wheel steering, Valtra ANTS is a true bidirectional machine without any particular front or back, making it the ultimate evolution of Valtra's TwinTrac philosophy.



Valtra ANTS Concept

08

WHEN THE CAB is in its most forward (or backward) position, Valtra ANTS can be used also as a tool carrier platform. This feature allows Valtra ANTS to carry things at the top of the central body, not just at the back of the machine like in conventional tractors. Moreover, if the driver – and therefore the cab – is not required, Valtra ANTS can carry a heavier payload.



09

WHILE CONVENTIONAL TRACTOR FRONT LOADERS are relatively restricted in terms of usage, Valtra ANTS has a completely new generation of front loader that combines the features of normal tractor front loaders, telehandlers and forest machine booms. It still has double arms like a normal front loader, but it is attached to the same pivot point as the cab itself. This allows the loader arms to turn sideways in the same direction as the cab is turning, providing the driver with outstanding visibility all the time. Both of the arms can also be controlled individually, which offers many new possibilities in terms of usage and implements. To keep the front loader small enough and still give it much greater reach than conventional front loaders, the Valtra ANTS front loader features inbuilt telescopic booms. This allows the entire front loader to fold at the back of the cab or the top of the frame when not needed.

10

WHILE THE HIGHLY INTELLIGENT VALTRA ANTS can perform most routine tasks by itself, the driver is still needed for more demanding and complex tasks. Both Valtra ANTS units can thus be equipped with a cab. Most tractor-related accidents occur when the driver climbs into or out of the cabin. This procedure is now completely eliminated, as the entire cab lowers to the ground, the windshield rises up and the seat slides out of the cabin. In other words, Valtra ANTS is not only a “stepless” machine in terms of transmission – it is also a true stepless machine in terms of entering and exiting the cab.

11

EVEN THOUGH VALTRA WAS THE FIRST TRACTOR BRAND IN THE WORLD to offer a standard safety cab, and current Valtra tractors offer extremely high comfort levels, the Valtra ANTS cab is in a league of its own. The unique composite frame structure offers outstanding visibility, while the electric transmission offers incredibly low noise levels. The cab is over-pressurized, which guarantees exceptional air quality inside the cabin, even in harsh environments. The innovative user interface can react to voice commands and different kinds of gestures. While current tractors use bigger screens to display the information, these screens also block visibility. Valtra ANTS has no normal screens at all. Instead it uses all the glass surfaces of the cabin to display the necessary information exactly where it is needed, giving a whole new meaning to the concept of “heads-up display”.



12

ONE OF THE KEY FEATURES OF VALTRA ANTS is the ability to change the cab from one unit to another just by driving two units against each other and sliding the cab to the top of the other unit. This means that the customer can have several Valtra ANTS units without a cab yet still use one cab with every one of those units when needed.

13

BY FAR THE MOST STRIKING FEATURE of Valtra ANTS is its ability to join two Valtra ANTS units together to form one big “Valtra ANTS Queen” unit. This allows the customer to combine one ANTS 100 and one ANTS 200 together to form one ANTS 300 Queen unit, or even combine two ANTS 200 units to one ANTS 400 Queen unit when absolutely maximum pulling power and traction is needed. This stunning feature provides maximum efficiency and utilisation throughout the year, as the need for big tractors is usually limited to certain jobs and certain times of the year. When two of the ANTS units are connected together they still have eight wheels, but the innovative axle construction allows the track width to be changed on the fly. As a result it only has three axles, which makes it more nimble, and it also has a combination of four-wheel steering and centre pivot steering.

14

THE VALTRA ANTS CONCEPT IS A VISION of how things might be someday in the future. Valtra has a great history of finding unique and innovative solutions, and Valtra ANTS continues this tradition. While Valtra ANTS is just a concept at the moment, it is based on true needs of customers and the rapidly changing world in which we live. Sometimes you have to question things to achieve something really new and valuable.



Transportation Scenario

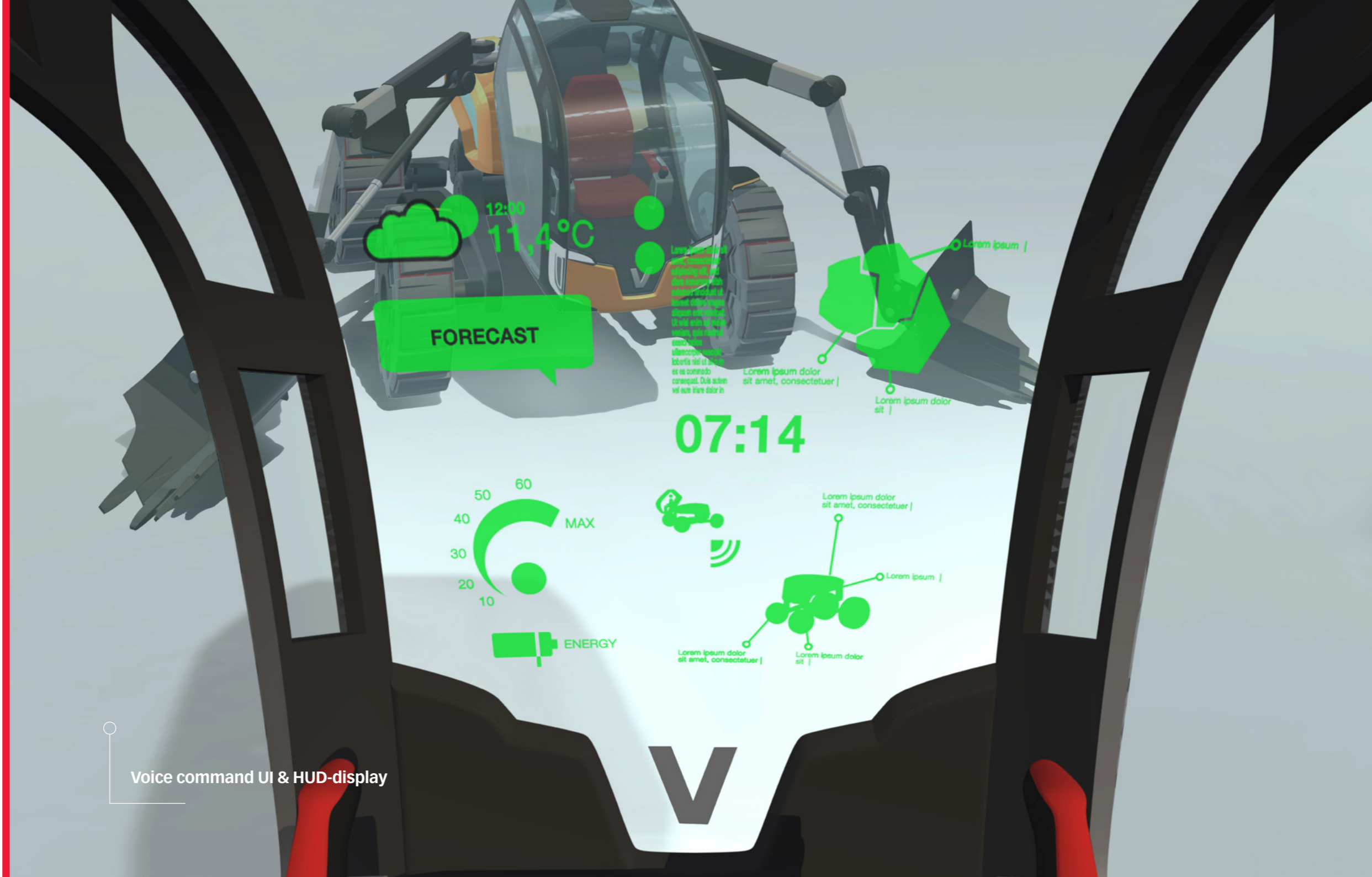
- Means of transportation will look different
- Energy production and fuel will vary
- Efficiency will be improved
- Environmental impact will be minimized
- Flexibility will be pronounced
- Versatility will be obvious
- Comfort will be a demand
- Intelligence will be included





Intelligent expandable tyres

Voice command UI & HUD-display



Four wheel steering allows multiple driving modes



01
Connecting
of two ANTS to
one powerfull
single unit

02
Cabin can be
swapped from
another unit to
another

03
Different
ANTS Queen
combinations
up to 400kW



Combination of
twin center pivots &
four wheel steering

Even though
ANTS looks
futuristic, it carries
on the tradition of
Valtra design.



No steps

Valtra ANTS

A concept for the future

In honour of Valtra's 60th anniversary, Valtra's Industrial Design Manager Kimmo Wihinen and his team looks into the future for a vision of what Valtra tractors will be like. The world has changed a lot since 1951, and is likely to change just as much in the next 60 years. The first step is vision, then planning, and then implementation. When the time comes, we will be ready for the challenges that the future will bring.

VALTRA IS CELEBRATING ITS 60TH ANNIVERSARY by looking into the future and introducing Valtra ANTS – a revolutionary concept tractor. ANTS is a play on words. It refers to Valtra's current model series: A, N, T and S. But it also characterizes the concept. Ants (*Formica rufa*) are considered to be extremely strong and social insects, and the ANTS concept reflects the hardworking characteristics of real ants.

Building on the tradition of innovation and customization for which Valtra is renowned, ANTS is strong, social, dynamic, agile and lightweight. ANTS has been designed for Valtra's traditional customer segment: family farms averaging 150 hectares in size, with the same number of livestock. These farms are also used to produce biomass, which is used in turn to produce biogas. Manure is used in a closed cycle to gather nutrients.

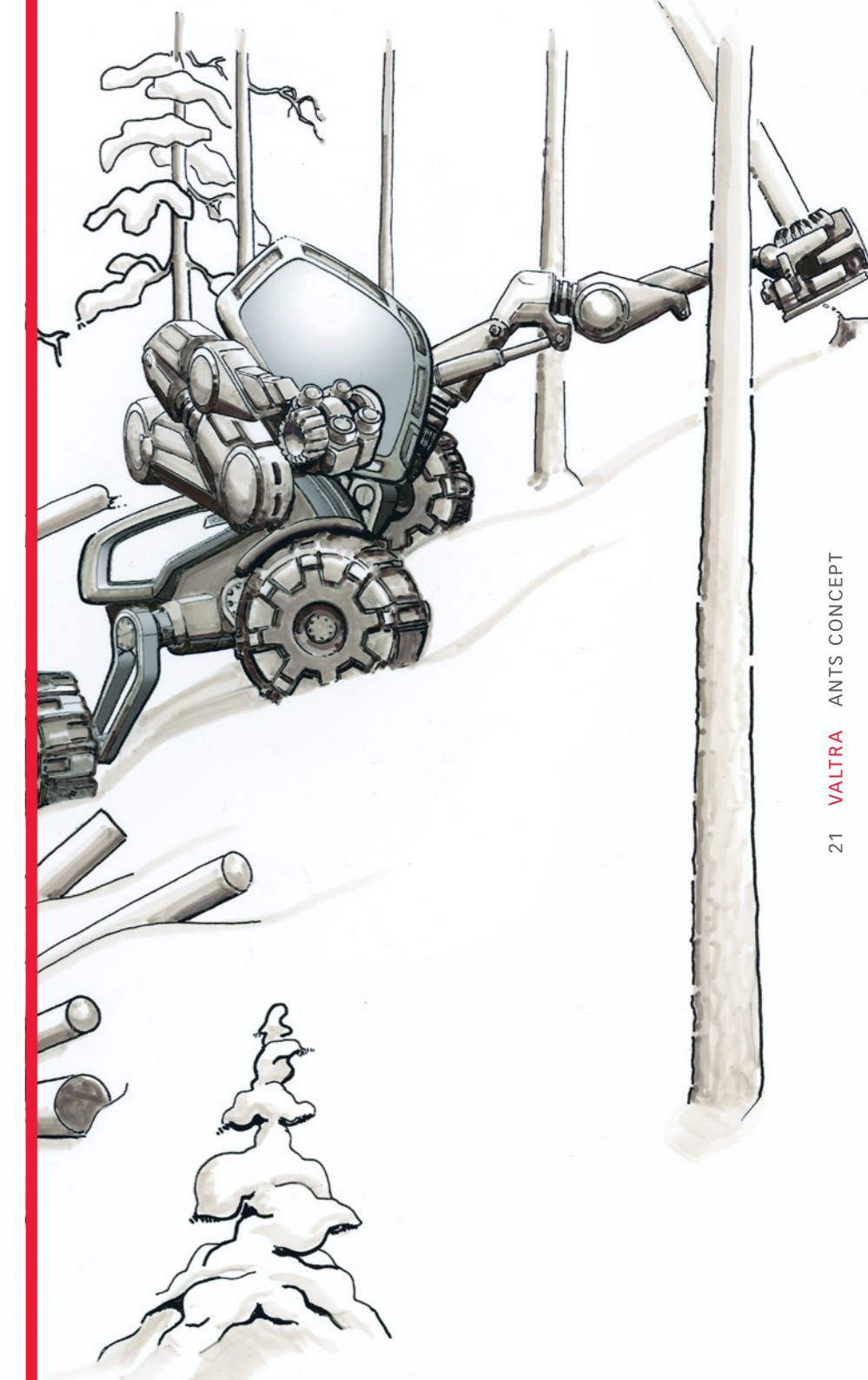
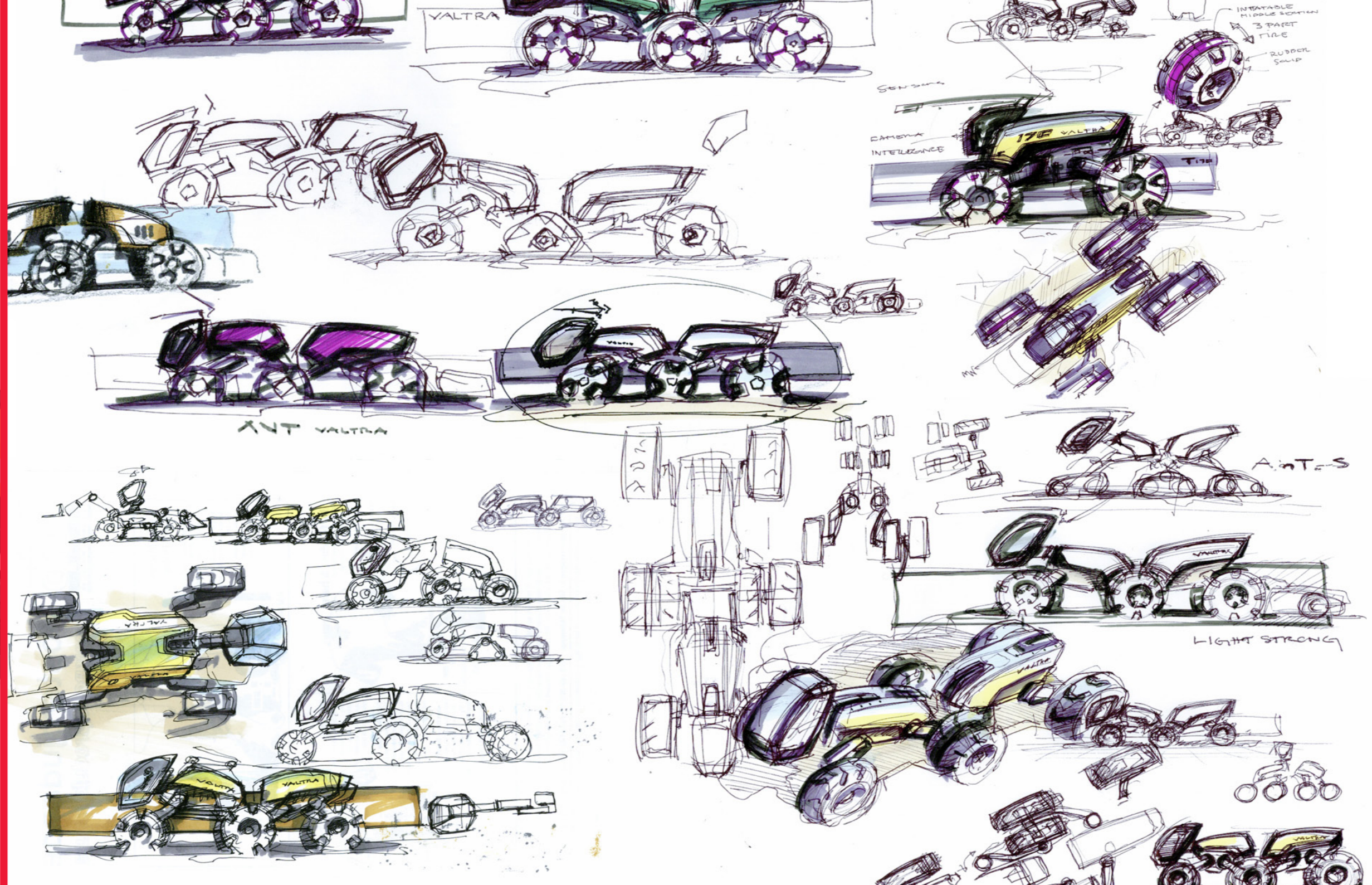
ANTS is a modular solution. It consists of two modules: a soldier unit with an output of 100 kW and a worker unit with an output of 200 kW. Each module can be used separately and independently. When a cab is needed, it can be attached to either module. If required the modules can be combined, creating an ANTS queen with three axles, eight wheels and an output of 300 kW.

The ANTS concept has been built in 1:5 scale by Valtra's R&D team together with the Swedish company Lighthouse. The concept was presented at Valtra's 60th anniversary celebration in January. The model can be seen at various agricultural exhibitions throughout 2011, including the SIMA exhibition in Paris and the Agritechnica exhibition in Hannover.

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Telescopic front loader with independent arms



100kW and 200kW
base modules –
one optional cabin



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